

that are potentially able to cause significant air emissions. In the absence of large-scale soil disturbances in specific areas, potential air emissions from the Site would be expected to remain near or below their detection limit in the samples and would not be measured.

### **3.3 Ecological Monitoring**

#### **3.3.1 Introduction**

The Ecology Group conducts ecological monitoring of the Site's ecological resources to ensure regulatory compliance and to preserve, protect, and manage those resources. Ecological monitoring is an integral aspect of determining whether the management objectives and goals for the natural resources at the Site are being achieved. This report summarizes the results of the ecological monitoring that was conducted at the Site during 2007.

At an elevation of approximately 6,000 feet, the Site contains a unique ecotonal mixture of mountain and prairie plant species resulting from the topography of the area and its proximity to the mountain front. The POU, the area surrounding COU (the general area where the former IA was once located), is one of the largest remaining undeveloped tracts of its kind along the Colorado Piedmont. A number of plant communities present at the Site have been identified as increasingly rare and unique by the Colorado Natural Heritage Program (CNHP 1994, 1995). These communities include the xeric tallgrass prairie, tall upland shrubland, wetlands, and Great Plains riparian woodland communities. Small inclusions of a number of other increasingly rare plant communities are also found on the Site. Many of these communities support populations of increasingly rare animals as well, including the federally protected PMJM, and other uncommon species such as the grasshopper sparrow, loggerhead shrike, Merriam's shrew, black crowned night heron, hops blue butterfly, and Arogos skipper.

During 2007, transfer of the POU was made to USFWS to create the Rocky Flats National Wildlife Refuge. As a result, the total acreage managed by DOE-LM is now approximately 1,308 acres in the COU. However, ecological monitoring was conducted by DOE in the POU prior to the transfer; the POU monitoring is also discussed in this report.

A summary of the highlights from the 2007 field season is provided in the following sections. Full, detailed summaries and analyses for each field monitoring effort are presented as stand-alone reports on the accompanying Ecology DVD.

#### **3.3.2 Vegetation Monitoring**

Vegetation monitoring reported here is conducted at the RFS to provide information necessary for management of the natural resources. Objectives of the vegetation monitoring in 2007 were to:

- Identify any new plant species records for the Site;
- Identify and document infestations of select noxious weeds at the Site to assist with planning of noxious weed control applications;
- Document and track the locations where herbicide applications were conducted in 2007;
- Document where revegetation activities were conducted in 2007;

- Evaluate the success of revegetation activities at the Site; and
- Conduct photomonitoring for visual documentation of changes in vegetation establishment at the Site.

### 3.3.2.1 Site Flora

The complete list of plant species known to occur at the Site as of the end of 2007 is found on the accompanying Ecology DVD. For purposes of the Site flora, the Site includes both the COU and POU areas. As a result of the 2007 field work, one new record of vascular plant species for the Site flora is reported. Leafy spurge (*Euphorbia uralensis*), a state-listed noxious weed, was found near the shooting range west of the PLF. The population was sprayed in fall 2007 to eradicate the plants. The area will continue to be checked for the next few years, and any plants that are found will be treated to eradicate the population. The following taxonomic name is used at the Site for the new plant species<sup>31</sup>:

Family	Scientific Name	Speccode	Common Name
Euphorbiaceae	<i>Euphorbia uralensis</i> Fisch. ex Link	EUUR1	leafy spurge

Voucher specimens of the species will be deposited at the University of Colorado Herbarium in Boulder, Colorado.

### 3.3.2.2 Weed Mapping and Weed Control

Resource management is an important concern at the Site with a goal to protect and sustain the native ecological resources that make the Site so unique along the Front Range. One of the challenges at the Site is to manage the ecological resources with a limited set of management tools. Currently most efforts focus on the control or eradication of the weed species themselves with little emphasis on trying to improve conditions for the desired native species. Two of the key tools for grassland management, fire and grazing, are not currently allowed or planned for use at the Site in the near future. As a result, management of the ecological resources in the COU is largely limited to controlling the noxious weeds themselves. The Comprehensive Conservation Plan (USFWS 2005), developed by USFWS for management of the Rocky Flats National Wildlife Refuge, has identified the full range of Integrated Pest Management tools for use at the Refuge for controlling weeds. This includes administrative, cultural, biological (including grazing), mechanical (including prescribed fire), and chemical as viable tools for controlling noxious weeds and ecosystem management. Thus there may be a greater opportunity for some of these other resource management tools to be used in the future.

The methods used for weed mapping are provided in the full report on the Ecology DVD at the end of this report.

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<sup>31</sup> Plant nomenclature follows that of GPFA (1986), Weber (1976), and Weber (1990) in that order of determination, when feasible. Species were verified at the University of Colorado Herbarium in Boulder, Colorado.

The 2007 weed distribution maps for diffuse knapweed (*Centaurea diffusa*) and dalmatian toadflax (*Linaria dalmatica*) are shown on Figure 3-238 and Figure 3-239, respectively. Table 3-98 presents the estimated total acreage and acreage-by-density categories for each species, based on the 2007 maps. The acreage values are only approximate and should not be interpreted as exact areas. In 2007, diffuse knapweed was observed on approximately 460 acres at various levels of infestation. Dalmatian toadflax was mapped on approximately 237 acres at the Site in 2007. The total area of the COU is approximately 1,308 acres.

*Table 3-98. 2007 Noxious Weed Acreage Summary*

Species	Density (acres)				Total
	High	Medium	Low	Scattered	
Diffuse knapweed	2.2	41.2	248.8	167.7	459.9
Dalmatian toadflax	77.1	51.0	0.0	109.0	237.1

During 2007, approximately 848 acres at the Site were treated with herbicides using ground applications. Approximately 468 acres were treated in the POU area and 380 acres were treated in the COU. Diffuse knapweed, dalmatian toadflax, musk thistle (*Carduus nutans*), common mullein (*Verbascum thapsus*), and Canada thistle (*Cirsium arvense*) have been the most significant noxious weed problems. Kochia (*Kochia scoparia*) is also a common problem in the first year or two in some of the revegetation areas. Figure 3-240 show the locations where herbicide was applied in 2007. Table 3-99 lists the target species, herbicides, and application rates applied at each location, and the approximate timing of the application during the year. Note that at several locations multiple herbicides are listed for a location. This does not mean that each herbicide was used across that entire location. Rather, depending on site-specific characteristics such as target weed species, the locations of water bodies, soil types, and the professional judgment of the licensed herbicide applicator, different herbicides were used within that location to provide the control needed.

The herbicide Milestone (active ingredient is aminopyralid) was used to treat several areas at the Site in 2007. This herbicide first became available on the market in 2006. Its advantages include a low application rate, a low environmental impact, and high effectiveness on many target species at the Site. The fact that it can be sprayed to the water's edge also makes it a good tool for controlling Canada thistle and other weedy species that are often present at the edges of ponds and wetlands. Previously, near water these species have been difficult or impossible to control with other methods. Milestone also seems to have at least a 2-year residual effect on preventing the establishment of target species such as diffuse knapweed at the Site.

The use of biocontrol insects continues at the Site. Additional biocontrols for different species may be released as they become available. Collections from established populations at the Site may be made and moved to other infestations at the Site where control is needed, as feasible.

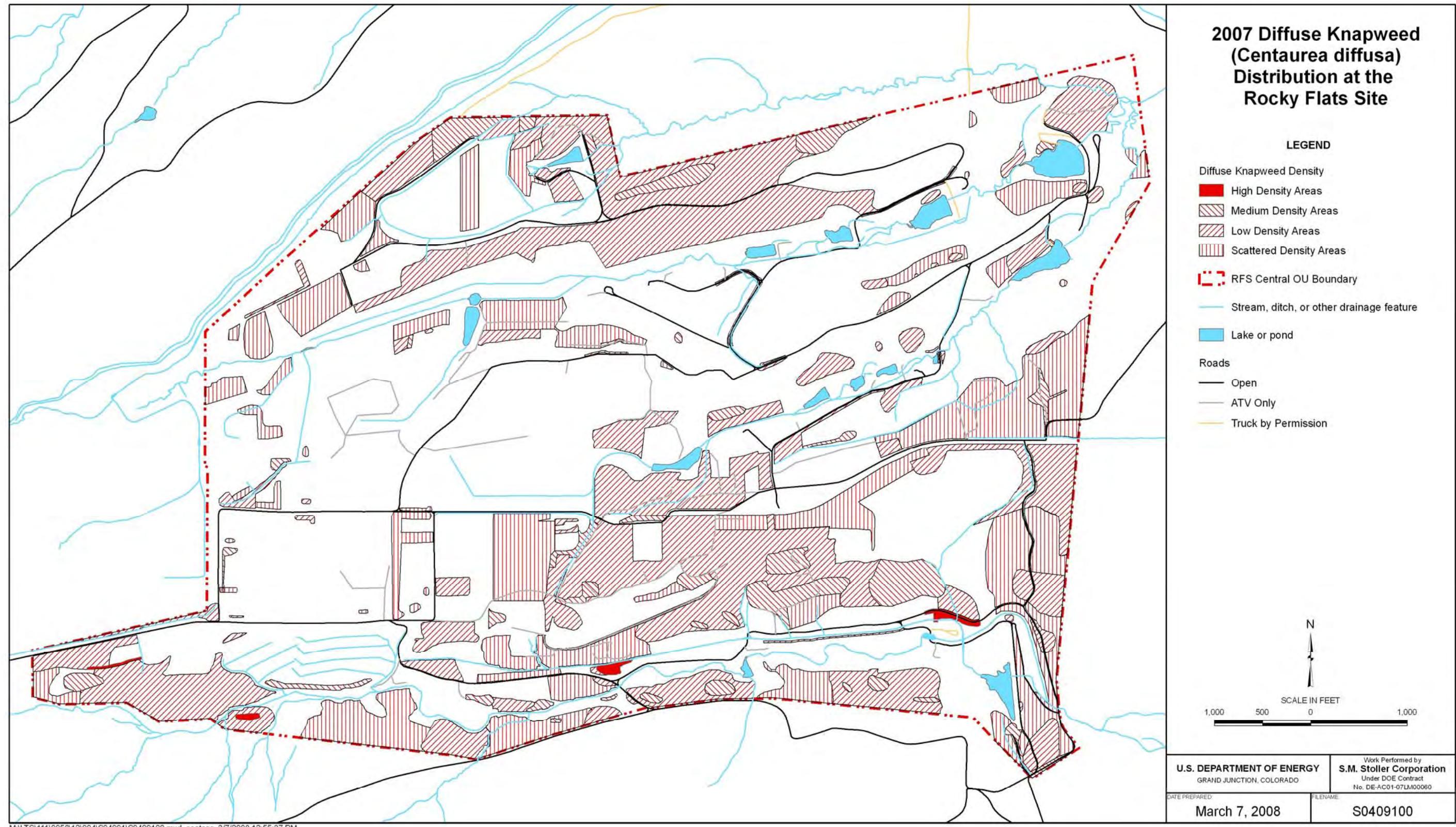


Figure 3-238. 2007 Diffuse Knapweed (*Centaurea diffusa*) Distribution at the Rocky Flats Site

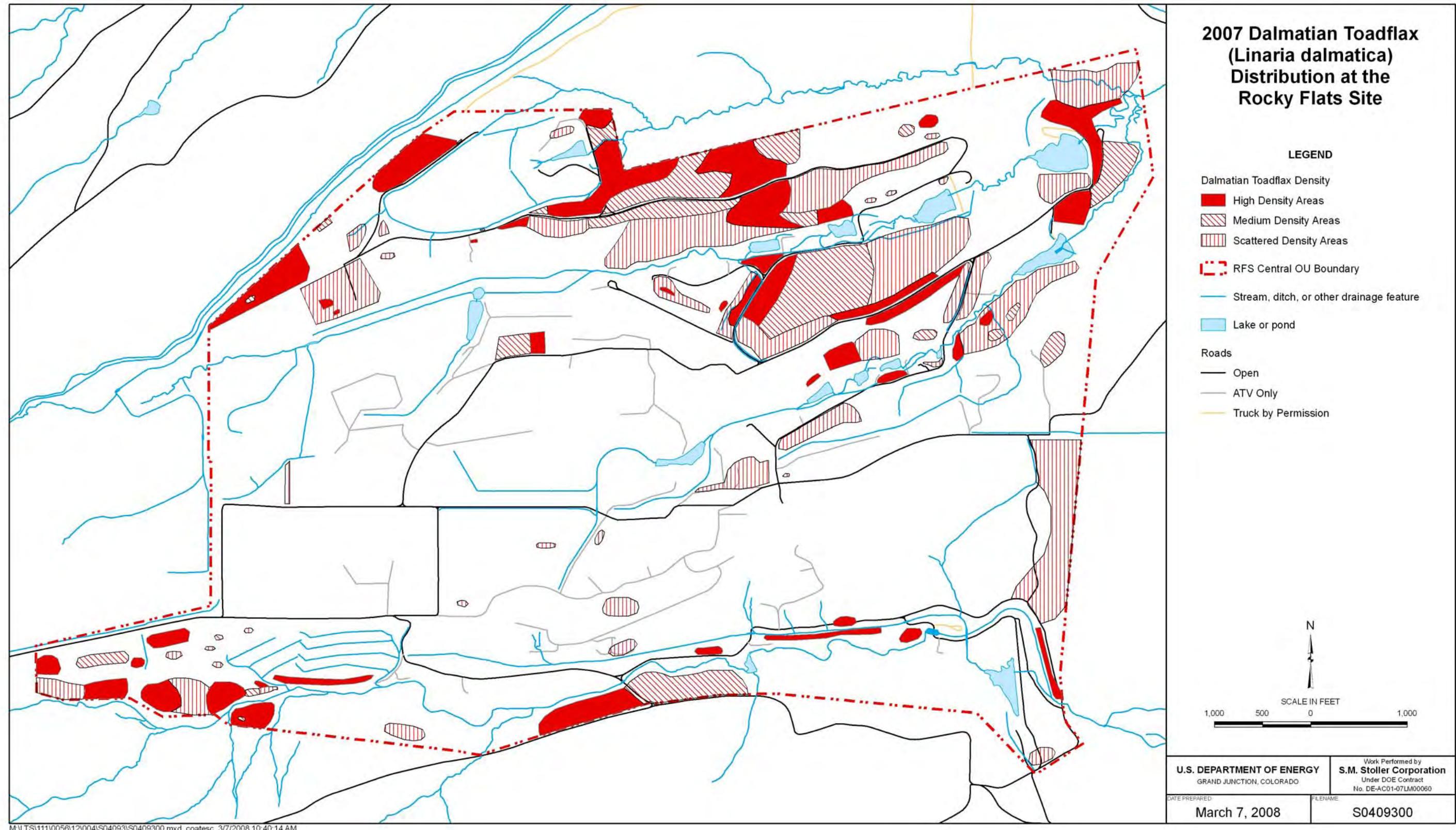
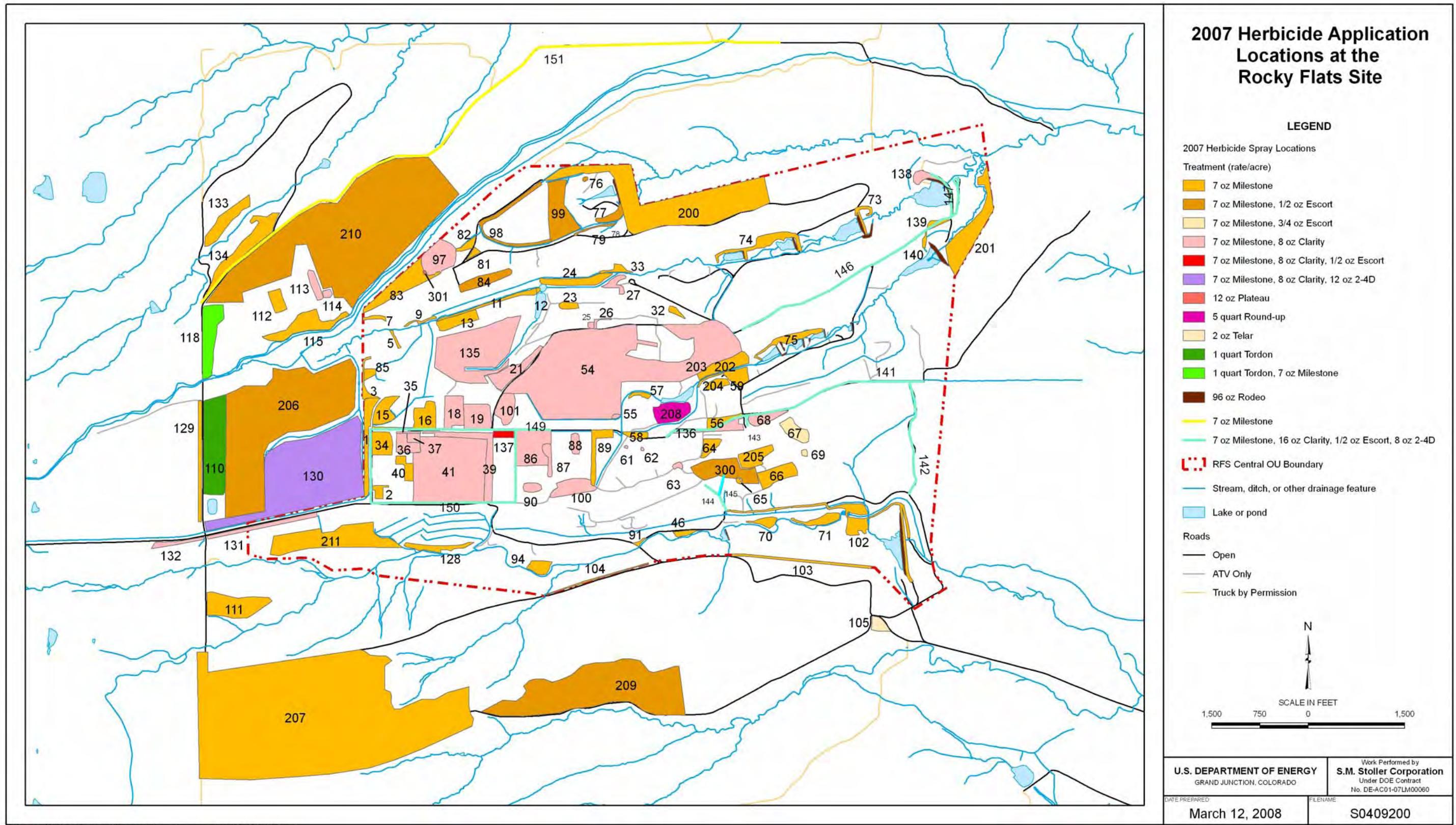


Figure 3-239. 2007 Dalmatian Toadflax (*Linaria dalmatica*) Distribution at the Rocky Flats Site



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Figure 3-240. 2007 Herbicide Application Locations at the Rocky Flats Site

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*Table 3-99. 2007 Herbicide Application Summary*

Location	Target Species*	Treatment**	Actual Acreage Treated	Time of Year Treated
1	CEDI1	7 oz Milestone	4.0	Spring 2007 Phase I
2	CEDI1	7 oz Milestone	1.0	Spring 2007 Phase I
3	CEDI1	7 oz Milestone	1.0	Spring 2007 Phase I
5	CEDI1, VETH1, ONAC1	7 oz Milestone	0.7	Spring 2007 Phase I
7	CEDI1	7 oz Milestone	0.8	Spring 2007 Phase I
9	CEDI1, VETH1, CIAR1	7 oz Milestone	0.6	Spring 2007 Phase I
11	CEDI1	7 oz Milestone	1.5	Spring 2007 Phase I
12	KOSC1	7 oz Milestone	0.3	Spring 2007 Phase I
13	CEDI1	7 oz Milestone	3.5	Spring 2007 Phase I
15	CEDI1	7 oz Milestone	2.5	Spring 2007 Phase I
16	CEDI1	7 oz Milestone	3.5	Spring 2007 Phase I
18	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	3.5	Spring 2007 Phase I
19	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	4.0	Spring 2007 Phase I
21	CEDI1	7 oz Milestone, 8 oz Clarity	4.0	Spring 2007 Phase I
23	CIAR1, CEDI1	7 oz Milestone	1.0	Spring 2007 Phase I
24	CIAR1	7 oz Milestone	3.5	Spring 2007 Phase I
25	KOSC1	7 oz Milestone, 8 oz Clarity	0.3	Spring 2007 Phase I
26	CEDI1	7 oz Milestone, 8 oz Clarity	0.3	Spring 2007 Phase I
27	CEDI1, CIAR1, KOSC1	7 oz Milestone, 8 oz Clarity	1.0	Spring 2007 Phase I
32	CEDI1, KOSC1	7 oz Milestone	0.5	Spring 2007 Phase I
33	CIAR1	7 oz Milestone	2.0	Spring 2007 Phase I
34	CEDI1	7 oz Milestone	3.0	Spring 2007 Phase I
35	CEDI1	7 oz Milestone, 8 oz Clarity	0.3	Spring 2007 Phase I
36	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	2.5	Spring 2007 Phase I
37	KOSC1	7 oz Milestone, 8 oz Clarity	1.0	Spring 2007 Phase I
39	CEDI1, CANU1, VETH1	7 oz Milestone, 8 oz Clarity	4.5	Spring 2007 Phase I
40	CEDI1	7 oz Milestone	1.8	Spring 2007 Phase I
41	CEDI1	7 oz Milestone, 8 oz Clarity	23.3	Spring 2007 Phase I
46	CEDI1	7 oz Milestone	0.5	Spring 2007 Phase I
54	CEDI, MEOF1, KOSC1	7 oz Milestone, 8 oz Clarity	72.0	Spring 2007 Phase I
55	ONAC1	7 oz Milestone, 8 oz Clarity	0.3	Spring 2007 Phase I
56	CEDI1	7 oz Milestone	1.3	Spring 2007 Phase I
57	CIAR1	7 oz Milestone	0.8	Spring 2007 Phase I
58	CIAR1	7 oz Milestone	0.8	Spring 2007 Phase I
59	CIAR1	7 oz Milestone	2.0	Spring 2007 Phase I
61	CEDI1	7 oz Milestone, 8 oz Clarity	0.3	Spring 2007 Phase I
62	VETH1, KOSC1	7 oz Milestone, 8 oz Clarity	0.5	Spring 2007 Phase I
63	CEDI1	7 oz Milestone, 8 oz Clarity	0.3	Spring 2007 Phase I
64	CEDI1	7 oz Milestone	1.5	Spring 2007 Phase I
65	CEDI1	7 oz Milestone	0.3	Spring 2007 Phase I
66	CEDI1, CIAR1	7 oz Milestone	3.8	Spring 2007 Phase I
67	VETH1	7 oz Milestone, 3/4 oz Escort	2.0	Spring 2007 Phase I
68	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	2.0	Spring 2007 Phase I

Table 3-99 (continued). 2007 Herbicide Application Summary

Location	Target Species*	Treatment**	Actual Acreage Treated	Time of Year Treated
69	VETH1	7 oz Milestone, 3/4 oz Escort	1.0	Spring 2007 Phase I
70	VETH1	7 oz Milestone	1.0	Spring 2007 Phase I
71	VETH1, CACH1	7 oz Milestone	1.5	Spring 2007 Phase I
73	CEDI1	7 oz Milestone	1.0	Spring 2007 Phase I
74	CEDI1	7 oz Milestone	4.0	Spring 2007 Phase I
75	CEDI1, CIAR1	7 oz Milestone	2.0	Spring 2007 Phase I
76	CIAR1	7 oz Milestone, 1/2 oz Escort	1.0	Spring 2007 Phase I
77	CEDI1	7 oz Milestone, 1/2 oz Escort	1.5	Spring 2007 Phase I
78	VETH1, CIAR1	7 oz Milestone, 1/2 oz Escort	0.3	Spring 2007 Phase I
79	VETH1	7 oz Milestone, 1/2 oz Escort	0.5	Spring 2007 Phase I
81	CEDI1	7 oz Milestone	0.3	Spring 2007 Phase I
82	CEDI1	7 oz Milestone	1.0	Spring 2007 Phase I
83	CEDI1	7 oz Milestone	6.0	Spring 2007 Phase I
84	VETH1, CEDI1	7 oz Milestone, 1/2 oz Escort	4.0	Spring 2007 Phase I
85	CEDI1	7 oz Milestone	0.5	Spring 2007 Phase I
86	CEDI1	7 oz Milestone, 8 oz Clarity	7.5	Spring 2007 Phase I
87	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	1.0	Spring 2007 Phase I
88	CEDI1	7 oz Milestone, 8 oz Clarity	1.5	Spring 2007 Phase I
89	CEDI1	7 oz Milestone	2.5	Spring 2007 Phase I
90	CEDI1	7 oz Milestone, 8 oz Clarity	1.0	Spring 2007 Phase I
91	CEDI1, CIAR1	7 oz Milestone	0.3	Spring 2007 Phase I
94	VETH1	7 oz Milestone	2.0	Spring 2007 Phase I
97	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	5.0	Spring 2007 Phase I
98	CEDI1	7 oz Milestone, 1/2 oz Escort	5.0	Spring 2007 Phase I
99	CEDI1	7 oz Milestone, 1/2 oz Escort	7.0	Spring 2007 Phase I
100	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	3.5	Spring 2007 Phase I
101	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	3.0	Spring 2007 Phase I
102	CEDI1	7 oz Milestone	7.0	Spring 2007 Phase I
103	CEDI1	7 oz Milestone	2.0	Spring 2007 Phase I
104	CEDI1	7 oz Milestone	0.8	Spring 2007 Phase I
105	CERE1	2 oz Telar	1.0	Spring 2007 Phase II
110	CEDI1	1 quart Tordon	12.0	Spring 2007 Phase II
111	CEDI1	7 oz Milestone	7.0	Spring 2007 Phase II
112	CEDI1	7 oz Milestone	2.0	Spring 2007 Phase II
113	CEDI1	7 oz Milestone, 8 oz Clarity	1.5	Spring 2007 Phase II
114	KOSC1	7 oz Milestone, 8 oz Clarity	0.5	Spring 2007 Phase II
115	CEDI1	7 oz Milestone	5.0	Spring 2007 Phase II
118	CEDI1	1 quart Tordon, 7 oz Milestone	7.0	Spring 2007 Phase II
128	CEDI1	7 oz Milestone	3.0	Spring 2007 Phase II
129	CEDI1	7 oz Milestone	3.0	Spring 2007 Phase II
130	CEDI1	7 oz Milestone, 8 oz Clarity, 12 oz 2-4D	43.0	Spring 2007 Phase II
131	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	4.0	Spring 2007 Phase II
132	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	2.0	Spring 2007 Phase II
133	CEDI1, CIAR1	7 oz Milestone	4.0	Spring 2007 Phase II
134	CEDI1, CIAR1	7 oz Milestone	8.0	Spring 2007 Phase II
135	MEOF1, CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	28.0	Spring 2007 Phase II
136	CEDI1, KOSC1	7 oz Milestone, 8 oz Clarity	4.0	Spring 2007 Phase II

Table 3-99 (continued). 2007 Herbicide Application Summary

Location	Target Species*	Treatment**	Actual Acreage Treated	Time of Year Treated
137	CEDI1, KOSC1, CADR1	7 oz Milestone, 8 oz Clarity, 1/2 oz Escort	3.0	Spring 2007 Phase II
138	CEDI1, CIAR1	7 oz Milestone, 8 oz Clarity	1.8	Spring 2007 Phase II
139	CEDI1, CIAR1	7 oz Milestone	1.0	Spring 2007 Phase II
140	CEDI1, CIAR1	7 oz Milestone	0.8	Spring 2007 Phase II
141	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	3.8	Spring 2007 Phase II
142	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	1.6	Spring 2007 Phase II
143	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	0.1	Spring 2007 Phase II
144	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	0.5	Spring 2007 Phase II
145	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	0.3	Spring 2007 Phase II
146	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	4.2	Spring 2007 Phase II
147	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	0.8	Spring 2007 Phase II
149	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	3.6	Spring 2007 Phase II
150	KOSC1, CEDI1	7 oz Milestone, 16 oz Clarity, 1/2 oz Escort, 8 oz 2-4D	3.1	Spring 2007 Phase II
151	CEDI1	7 oz Milestone	16.0	Fall 2007
200	CEDI1, CIAR1	7 oz Milestone	36.0	Fall 2007
201	CEDI1, CIAR1	7 oz Milestone	9.0	Fall 2007
202	CEDI1, CIAR1	7 oz Milestone	3.5	Fall 2007
203	CEDI1, CIAR1	7 oz Milestone	0.5	Fall 2007
204	CEDI1, CIAR1	7 oz Milestone	2.0	Fall 2007
205	CEDI1, CIAR1	7 oz Milestone	3.5	Fall 2007
206	CEDI1, CIAR1	7 oz Milestone, 1/2 oz Escort	60.0	Fall 2007
207	CEDI1, CIAR1	7 oz Milestone	155.0	Fall 2007
208	Total Kill	5 quart Round-up	3.5	Fall 2007
209	CEDI1, CIAR1	7 oz Milestone, 1/2 oz Escort	46.0	Fall 2007
210	CEDI1	7 oz Milestone, 1/2 oz Escort	93.0	Fall 2007
211	CEDI1, CIAR1	7 oz Milestone	13.0	Fall 2007
300	CEDI1, CIAR1, CACH1	7 oz Milestone, 1/2 oz Escort	6.0	Spring 2007 Phase II
301	EUES1	12 oz Plateau	0.1	Fall 2007
NA	Total Kill	96 oz Rodeo (riprap on dam faces)	3.5	Spring 2007 Phase II
		Total Acreage Treated in 2007	848.1	

Species Codes: CEDI1 = Diffuse knapweed, KOSC1 = Kochia, CIAR1 = Canada thistle, CADR1 = Tall mustard, CERE1 = Russian knapweed, EUES1 = Leafy spurge, VETH1 = Mullein, MEOF1 = Yellow sweet clover, ONAC1 = Scotch thistle

\*\* Each herbicide listed was not sprayed across the entire area. The first herbicide listed was the primary herbicide used across the entire area. The additional herbicides were used at select locations within each area to target specific species.

### 3.3.2.3 Revegetation Activities in 2007

During 2007, several locations where previous revegetation efforts had not been successful were redone. The locations that were redone included areas that were previously roads, parking areas, and building foundations where poor soil and substrate conditions existed after closure. Two other locations were also redone after additional project activities were completed in 2007. Figure 3-241 shows the locations at the Site where the large-scale revegetation activities were conducted in 2007. A total of 105 acres areas were redone with various soil amendments. Table 3-100 lists each location and the revegetation activities that were conducted in 2007. A number of other locations were interseeded by hand or using an ATV-mounted broadcast seeder with the appropriate seed mix to help increase the amount of vegetation cover.

### 3.3.2.4 Revegetation Monitoring

As part of the cleanup and closure of the Site, the buildings, roads, and other infrastructure in the former IA were removed. Approximately 650 acres were disturbed during cleanup activities, which were completed in fall 2005. Revegetation of the disturbed areas was conducted to prevent erosion and sedimentation of the Site streams and to meet water-quality standards.

Reestablishment of native plant species is also desirable to benefit wildlife and provide desirable vegetation and ground cover adjacent to the Rocky Flats National Wildlife Refuge. As part of the revegetation process, monitoring is conducted to determine whether success criteria, as stated in the *Rocky Flats, Colorado, Site Revegetation Plan* (Revegetation Plan; DOE 2005b) are being met as well as to determine whether management of these revegetation areas are needed. This section summarizes the revegetation monitoring results for data collected during 2007. The objective of the revegetation monitoring in 2007 was to assess the success of the revegetation efforts at select locations. The methods used for the revegetation monitoring are provided in the full report on the Ecology DVD at the end of this report. Figure 3-242 shows the locations at the Site where revegetation monitoring was conducted in 2007.

Table 3-101 shows the total species richness (number of species) found at each revegetation location. Species richness in 2007 at the revegetation locations ranged from a low of 7 species in unit A40 to 47 species in unit A22. Table 3-102, Table 3-103, Table 3-104, Table 3-105, Table 3-106, Table 3-107, Table 3-108, and Table 3-109 show the actual species that were present at each revegetation location. The wide range in the number of species present in each revegetation location is attributable to a number of factors, including how long ago the area was revegetated, the size of the location, the number of quadrats sampled in the location, the degree of disturbance in the area prior to revegetation, and the management actions (e.g., weed control) that have been conducted in the area.

Thirteen different seeded graminoid species have established and are growing at some or all locations in 2007. Table 3-101 lists the species that were seeded at each revegetation location and the number of seeded species found growing there in 2007. These included western wheatgrass (*Agropyron smithii*), slender wheatgrass (*Agropyron caninum* = *Agropyron trachycaulum*), Canada wildrye (*Elymus canadensis*), junegrass (*Koleria pyrimidata*), green needle grass (*Stipa viridula*), big bluestem (*Andropogon gerardii*), little bluestem (*Andropogon scoparius*), side-oats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*), switchgrass (*Panicum virgatum*), Indian grass (*Sorghastrum*

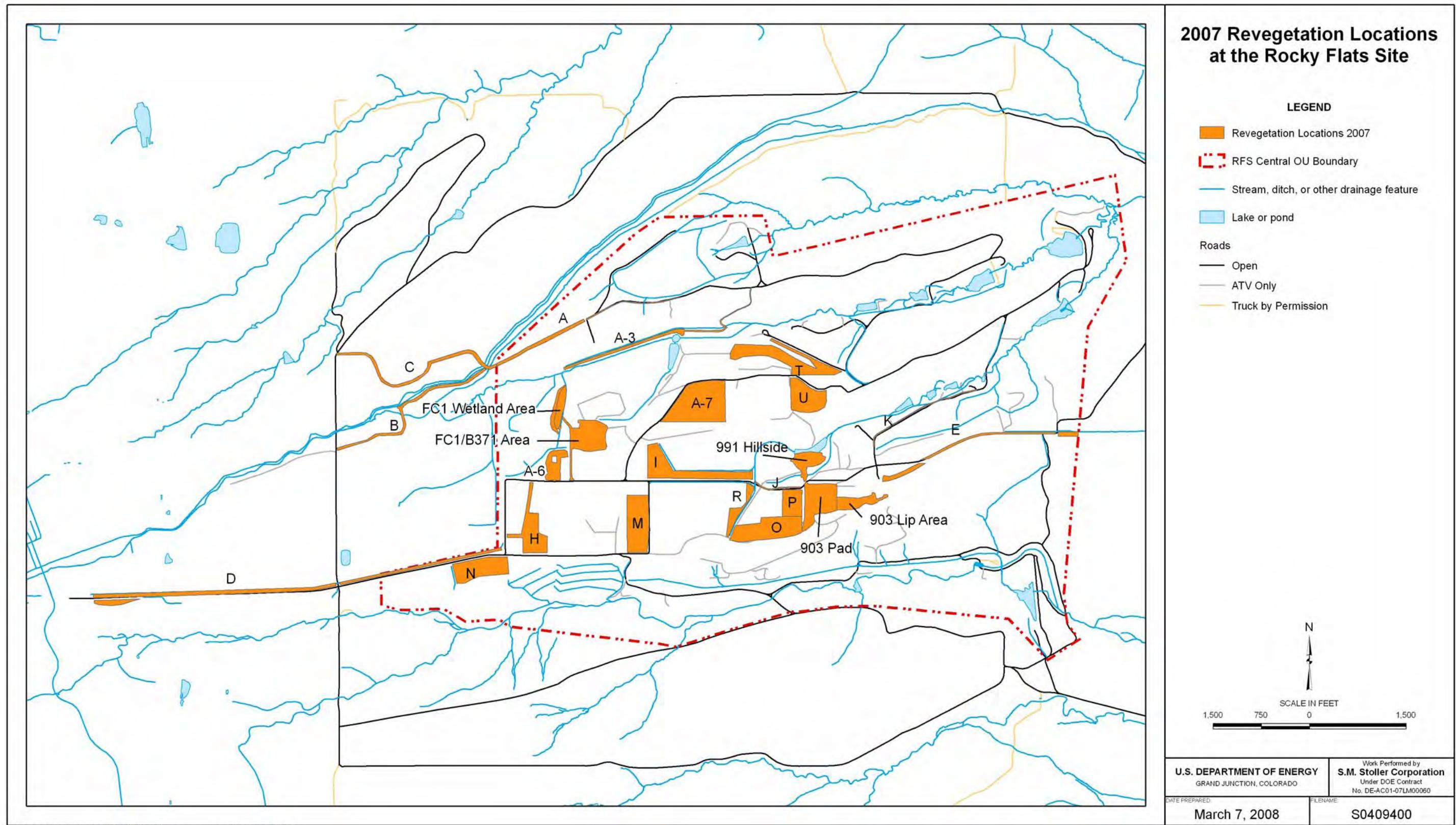


Figure 3-241. 2007 Revegetation Locations at the Rocky Flats Site

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*nutans*), and sand dropseed (*Sporobolus cryptandra*). Only western wheatgrass and slender wheatgrass were established at all 36 locations. As would be expected in a revegetation project, many other early successional species were growing at many of the areas. Kochia, wild lettuce (*Lactuca serriola*), yellow sweet clover (*Melilotus officinalis*), and Russian thistle (*Salsola iberica*) were among the more abundant species. These will largely disappear on their own over the next couple of years as the seeded species begin to fill in more. Several noxious weeds also occurred in the revegetation areas. The most common of these were diffuse knapweed, downy brome (*Bromus tectorum*), and fillaree (*Eurotium cicutarium*). Weed management will be conducted as needed to keep noxious weed populations down in the revegetation areas and enable the desired seeded species to establish more quickly and compete successfully with the weeds.

Table 3-100. 2007 Revegetation Locations\*

Location	Acreage	Compost	Biosol/Sustane	Mycorrhizal Inoculent	Seed Mix	Erosion Controls
A	2.1	Yes	Biosol	Yes	Flat Areas	Flexterra
B	2.6	Yes	Biosol	Yes	Flat Areas	Flexterra
C	3.0	Yes	Biosol	Yes	Flat Areas	Flexterra
D	8.2	Yes	Biosol	Yes	Flat Areas	Flexterra
E	3.1	Yes	Biosol	Yes	Flat Areas	Flexterra
H	5.1	Yes	Biosol	Yes	Flat Areas	Flexterra
I	7.1	Yes	Biosol	Yes	Flat Areas	Flexterra/Wattles
J	0.3	Yes	Biosol	Yes	Flat Areas	Flexterra
K	0.6	Yes	Biosol	Yes	Hillside Areas	Flexterra
M	6.8	Yes	Biosol	Yes	Flat Areas	Flexterra
N	5.6	Yes	Biosol	Yes	Flat Areas	Flexterra
O	7.4	Yes	Biosol	Yes	Flat Areas	Flexterra
P	2.9	Yes	Biosol	Yes	Flat Areas	Flexterra
R	1.7	Yes	Biosol	Yes	Flat Areas	Flexterra
T	7.7	Yes	Biosol	Yes	Hillside Areas	Flexterra
U	5.1	Yes	Biosol	Yes	Flat Areas	Flexterra
A-3	2.5	Yes	Sustane	Yes	Hillside Areas	Flexterra/Wattles
A-6	2.4	Yes	Sustane	Yes	Flat Areas	Flexterra/Wattles
A-7	11.2	Yes	Sustane	Yes	Flat Areas	Flexterra
FC1 Wetland Area	1.5	No	No	No	Wetland	Wattles
FC1/B371 Area	6.8	No	Biosol	Yes	Flat Areas	Flexterra/Wattles
903 Lip Area	2.5	No	Biosol	Yes	Flat Areas	Flexterra/Wattles
903 Pad	6.1	No	Biosol	Yes	Flat Areas	Flexterra/Wattles
991 Hillside	2.7	No	Biosol	Yes	Hillside Areas	Flexterra/Wattles
Total Acres	105.0					

\* Locations that were revegetated using heavy equipment.

Compost application rate = 40 tons/acre, Biosol application rate = 1000 lbs/acre, Sustane = 540 lbs/acre, Mycorrhizal inoculant = 60 lbs/acre

Flexterra application rate = Slopes (3,500 lbs/acre), Flat areas (3,000 lbs/acre)

Slightly different seed mixes were used at the revegetation locations depending on the year they were seeded and the slope position. One of the success criteria in the Revegetation Plan states that at least 50 percent of the seeded species must be present in an area for it to be considered successful. Table 3-101 lists the revegetation location, species in the seed mix, number of seeded species, number of species present at the location in 2007, and percentage present at the location in 2007. Nineteen locations had 50 percent or more seeded species present in 2007 and have thus met this success criterion (Table 3-110). Table 3-111 lists the date when the revegetation locations were originally seeded, whether they have been reseeded with soil amendments added, and what erosion controls were used.

Locations 26–40 were each reseeded in 2007 with soil amendments to help improve the soil conditions at these locations. As a result, most of these latter locations did not meet the success criterion of having at least 50 percent of the seeded species present. For the other locations that did not meet this criterion in 2007, other reasons may explain why many of the seeded species have not established—inadequate or uneven initial seeding, poor soil conditions, competition from the more aggressive cool season graminoid species in the seed mix, or drought. The monitoring methodology may also contribute to the apparent lack of seeded species present because this measure is based solely on the species list generated from the quadrat sampling. Given the small size of the total area measured on the ground through the quadrat method, it is quite feasible that more of the seeded species are present at the revegetation locations but are simply outside the “footprint” of the randomly located quadrats in 2007.

Ground cover protection from rock, litter, and current-year live vegetation varied from 59 percent to over 100 percent at the revegetation locations in 2007 (Table 3-112). The occasional values over 100 percent are a result of the cover class system used for estimating cover, which estimates cover values into a range and uses the midpoint of the cover class for analysis. Another success criterion outlined in the Revegetation Plan (K-H 2005b) states that a minimum of 70 percent total ground cover comprising litter cover, current-year live vegetation basal cover, and rock cover is to be present to help prevent erosion. All but four locations met this criterion in 2007 (Table 3-110). At most of the locations the greatest cover came from litter or rock. Currently, much of the litter category comes from the erosion control materials that are in place (i.e., erosion mats and Flexterra). In time, the dominant ground cover will be from natural litter as dead plant matter falls to the ground at the end of each growing season and builds up. Until the natural plant litter increases, however, the erosion control materials provide an artificial litter to protect the ground surface from erosion.

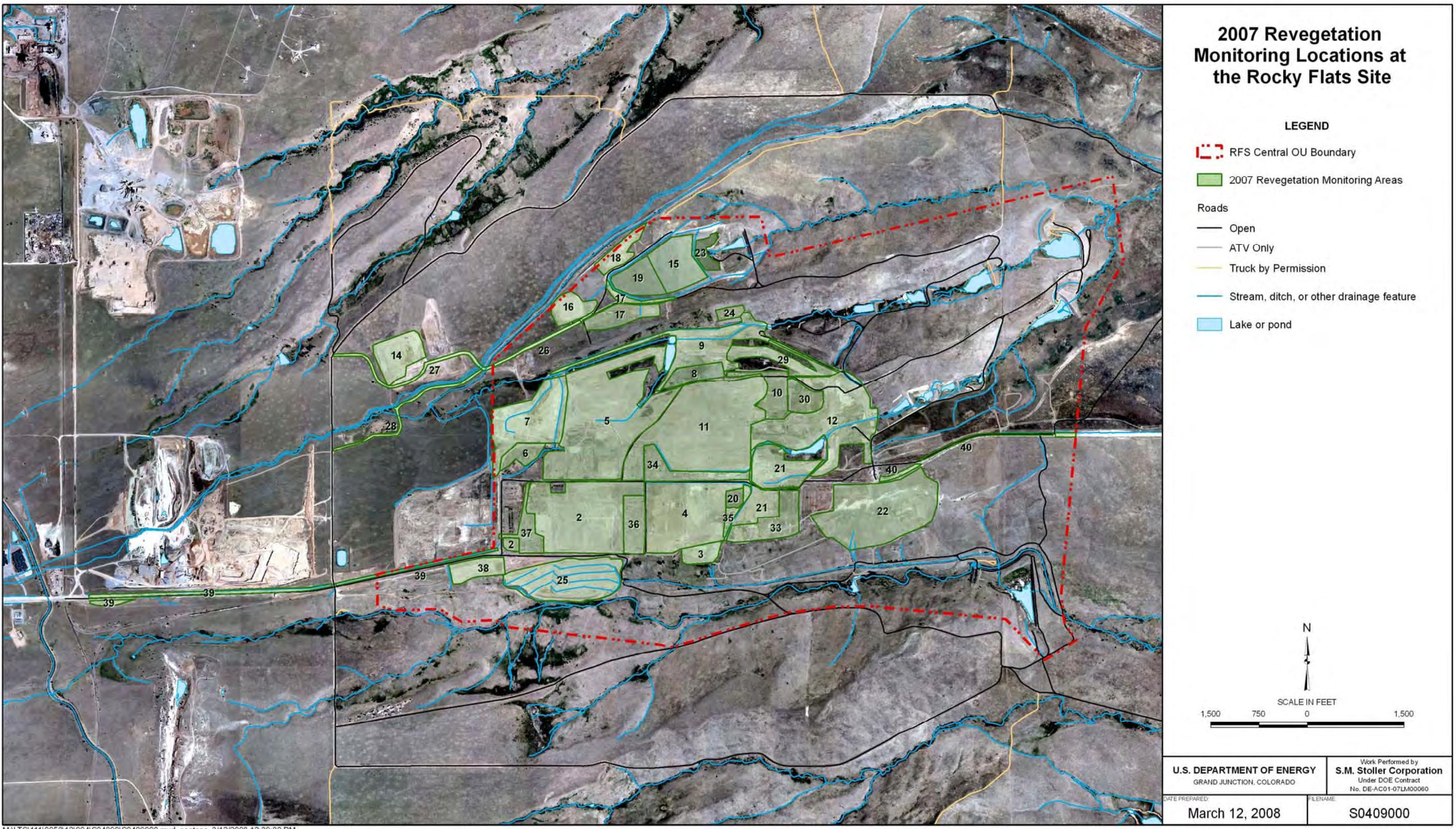


Figure 3-242. 2007 Revegetation Monitoring Locations at the Rocky Flats Site

Table 3-101. Species Seeded by Location and 2007 Total Species Richness Summary

Family	Scientific Name	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30	A33	A34	A35	A36	A37	A38	A39	A40
<b>Graminoids</b>																																					
POACEAE	<i>Agropyron caninum</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
POACEAE	<i>Agropyron dasystachum</i>		X				X	X				X	X			X	X			X	X	X				X											
POACEAE	<i>Agropyron lanceolatus</i>											X				X																					
POACEAE	<i>Agropyron smithii</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Andropogon gerardii</i>	X		X	X	X			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Andropogon scoparius</i>	X		X	X	X			X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Bouteloua curtipendula</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Bouteloua gracilis</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Buchloe dactyloides</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Elymus canadensis</i>						X																														
POACEAE	<i>Koleria pyramidata</i>	X		X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Panicum virgatum</i>				X																																
POACEAE	<i>Poa canbyi</i>												X				X																				
POACEAE	<i>Sorghastrum nutans</i>	X		X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Sporobolus cryptandrus</i>	X		X	X	X			X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X						
POACEAE	<i>Stipa viridula</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
<b>Forbs</b>																																					
ASTERACEAE	<i>Achillea millefolium</i>																					X															
ASTERACEAE	<i>Gallarida aristata</i>											X						X																			
ASTERACEAE	<i>Liatris punctata</i>											X						X																			
ASTERACEAE	<i>Ratibida columnifera</i>										X						X				X																
LINACEAE	<i>Linum lewisii</i> (L. perenne)																X			X																	
Total # Species Seeded	11	7	11	11	11	13	7	7	11	11	11	14	13	11	11	11	13	15	11	11	7	10	7	11	11	7	11	11	11	11	11	11					
# Present in 2007	6	3	8	5	9	9	5	6	4	9	5	9	8	5	8	7	6	4	8	7	4	5	5	5	7	6	3	2	6	2	5	2	3	3	2		
% Seeded Species Present in 2007	55	43	73	45	82	69	71	86	36	82	45	64	62	45	73	64	46	27	73	64	57	50	71	45	64	55	43	18	55	18	45	18	27	27	18		
Total Species Richness in 2007	26	22	30	23	30	27	15	34	13	27	24	17	23	12	29	24	17	18	25	47	9	19	26	16	24	22	26	23	24	16	24	16	14	24	18	7	

Table 3-102. Species Foliar Cover Summary at Locations A2–A5

Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season	Noxious Weed	A2		A3		A4		A5	
						Absolute Cover (%)	Relative Cover (%)						
<i>Alyssum alyssoides</i> (L.) L.	ALAL1	F	N			0.1	0.2						
<i>Alyssum minus</i> (L.) Rothmaler var. <i>micranthus</i> (C. A. Mey.) Dudley	ALMI1	F	N			1.8	5.1	1.0	2.2	1.2	2.9	0.6	1.2
<i>Barbarea vulgaris</i> R. Br.	BAVU1	F	N										
<i>Camelina microcarpa</i> Andr. ex DC.	CAMI1	F	N										
<i>Centaurea diffusa</i> Lam.	CEDI1	F	N		X	0.7	1.9	0.3	0.5	0.3	0.8	0.5	1.1
<i>Chenopodium album</i> L.	CHAL1	F	N										
<i>Cirsium arvense</i> (L.) Scop.	CIAR1	F	N		X					0.1	0.2	0.5	1.1
<i>Convolvulus arvensis</i> L.	COAR1	F	N		X			2.0	4.3				
<i>Cynoglossum officinale</i> L.	CYOF1	F	N		X							0.1	0.2
<i>Dyssodia papposa</i> (Vent.) Hitchc.	DYPA1	F	N										
<i>Erodium cicutarium</i> (L.) L'Her.	ERCI1	F	N		X	1.4	4.0	0.8	1.6	3.0	7.6	0.7	1.4
<i>Hypericum perforatum</i> L.	HYPE1	F	N		X								
<i>Kochia scoparia</i> (L.) Schrad.	KOSC1	F	N			1.8	4.9	5.8	12.4	2.7	6.7	3.3	7.1
<i>Lactuca serriola</i> L.	LASE1	F	N			0.3	0.9	0.8	1.6	1.2	2.9	0.4	0.9
<i>Lepidium campestre</i> (L.) R. Br.	LECA1	F	N										
<i>Linaria dalmatica</i> (L.) Mill.	LIDA1	F	N		X								
<i>Melilotus alba</i> Medic.	MEAL1	F	N							0.5	1.3	1.3	2.6
<i>Meilleottia officinalis</i> (L.) Pall.	MEOF1	F	N			3.3	9.1	0.8	1.6	1.4	3.6	19.0	40.2
<i>Medicago sativa</i> L. ssp. <i>sativa</i>	MESA1	F	N										
<i>Plantago lanceolata</i> L.	PLLA1	F	N			0.1	0.2			0.1	0.2		
<i>Plantago major</i> L.	PLMA1	F	N										
<i>Polygonum arenastrum</i> Jord. ex Bor.	POAR1	F	N			0.5	1.4			0.3	0.6	0.5	1.1
<i>Polygonum persicaria</i> L.	POPE2	F	N										
<i>Rumex crispus</i> L.	RUCR1	F	N										
<i>Salsola iberica</i> Senn. & Pau.	SAIB1	F	N			1.9	5.3	1.5	3.2	1.4	3.6	0.4	0.9
<i>Scorzonera laciniata</i> L.	SCLA1	F	N							0.6	1.5		
<i>Sisymbrium altissimum</i> L.	SIAL1	F	N			0.1	0.2						
<i>Sonchus arvensis</i> L. ssp. <i>arvensis</i> L.	SOAR1	F	N		X								
<i>Taraxacum officinale</i> Weber	TAOF1	F	N					0.3	0.5				
<i>Thlaspi arvense</i> L.	THAR1	F	N										
<i>Tragopogon dubius</i> Scop.	TRDU1	F	N			0.2	0.5			0.2	0.4		
<i>Verbascum thapsus</i> L.	VETH1	F	N		X					0.5	1.3		
<i>Agrostis scabra</i> Willd.	AGSC1	F	Y										
<i>Ambrosia artemisiifolia</i> L.	AMAR1	F	Y					2.3	4.8			0.5	1.1
<i>Ambrosia psilostachya</i> DC.	AMPS1	F	Y			0.1	0.2	0.3	0.5				
<i>Artemisia dracunculus</i> L.	ARDR1	F	Y										
<i>Aster falcatus</i> Lindl.	ASFA1	F	Y										
<i>Aster porteri</i> Gray	ASPO1	F	Y										
<i>Chenopodium fremontii</i> S. Wats.	CHFR1	F	Y										
<i>Chrysopsis villosa</i> Pursh.	CHVI1	F	Y										
<i>Conzya canadensis</i> (L.) Cronq.	COCA1	F	Y										
<i>Dalea candida</i> Michx. ex Willd. var. <i>oligophylla</i> (Torr.) Shinners.	DACA1	F	Y										
<i>Descurainia pinnata</i> (Walt.) Britt.	DEPI1	F	Y										
<i>Descurainia richardsonii</i> (Sweet) Schultz	DERI1	F	Y										
<i>Erigeron divergens</i> T. & G.	ERDI1	F	Y										
<i>Euphorbia serpyllifolia</i> Pers.	EUSE1	F	Y										
<i>Grindelia squarrosa</i> (Pursh.) Dun.	GRSQ1	F	Y			0.7	1.9	0.5	1.1	0.5	1.3	0.5	1.1
<i>Gutierrezia sarothrae</i> (Pursh.) Britt. & Rusby	GUSA1	F	Y					6.8	14.5	0.1	0.2	0.1	0.2
<i>Helianthus annuus</i> L.	HEAN1	F	Y										
<i>Lepidium densiflorum</i> Schrad.	LEDE1	F	Y										
<i>Lippia cuneifolia</i> (Torr.) Steud.	LICU1	F	Y										
<i>Linum perenne</i> L. var. <i>lewisii</i> (Pursh.) Eat. & Wright	LIPE1	F	Y										
<i>Mirabilis linearis</i> (Pursh.) Heimerl	MILI1	F	Y										
<i>Oenothera villosa</i> Thunb. ssp. <i>strigosa</i> (Rydb.) Dietrich & Raven	OEV11	F	Y										
<i>Potentilla gracilis</i> Dougl. ex Hook. var. <i>glabrata</i> (Lehm.) C. L. Hitchc.	POGR1	F	Y										
<i>Psoralea tenuiflora</i> Pursh.	PSTE1	F	Y										
<i>Ratibida columnifera</i> (Nutt.) Woot. & Standl.	RACO1	F	Y										
<i>Rumex maritimus</i> L.	RUMA1	F	Y										
<i>Senecio plattensis</i> Nutt.	SEPL1	F	Y										
<i>Silene antirrhina</i> L.	SIAN1	F	Y										
<i>Solanum triflorum</i> Nutt.	SOTR1	F	Y										
<i>Verbena bracteata</i> Lag. & Rodr.	VEBR1	F	Y							0.2	0.4	0.5	1.1
<i>Veronica peregrina</i> L. var. <i>xalapensis</i> (H. B. K.) St. John & Warren	VEPE1	F	Y										
<i>Xanthium strumarium</i> L.	XAST1	F	Y					0.3	0.5				
<i>Aegilops cylindrica</i> Host	AECY1	G	N	C	X								
<i>Agropyron cristatum</i> (L.) Gaertn.	AGCR1	G	N	C									
<i>Agropyron desertorum</i> (Fisch.) Schult.	ADGE1	G	N	C									
<i>Agropyron intermedium</i> (Host) Beauv.	AGIN1	G	N	C									
<i>Agropyron repens</i> (L.) Beauv.	AGRE1	G	N	C	X								
<i>Agrostis stolonifera</i> L.	AGST1	G	N	C									
<i>Bromus inermis</i> Leyss. ssp. <i>inermis</i>	BRIN1	G	N	C			0.8	1.6					
<i>Bromus japonicus</i> Thunb. ex Murr.	BRJA1	G	N	C		0.4	1.2	0.8	1.6	0.2	0.4	1.3	2.8
<i>Bromus tectorum</i> L.	BRTE1	G	N	C	X	0.8	2.3	0.3	0.5	1.0	2.5		
<i>Dactylis glomerata</i> L.	DAGL1	G	N	C									
<i>Festuca pratensis</i> Huds.	FEPR1	G	N	C						0.1	0.2		
<i>Lolium perenne</i> L. var. <i>aristatum</i> Willd.	LOPE1	G	N	C		0.1	0.2						
<i>Poa compressa</i> L.	POCO1	G	N	C									

Table 3-103. Species Foliar Cover Summary at Locations A6-A10

**Absolute Cover** – The percentage of the number of hits on a species out of the total number of hits possible.

Absolute Cover = The percentage of the number of hits on a species out of the total number of hits possible.  
Relative Cover = The percentage of the number of hits on a species out of the total number of vegetation hits

Relative Cover = The percentage of the number of Native Categories: Y = Native, N = Non-Native

Native Categories: Y = Native, N = Non-Native  
Growth Form Categories: F = Forb, G = Graminoid

Cool/Warm Season Categories: C = Cool-Season Graminoid, W = Warm-Season Graminoid

Noxious Weed Category: X = Noxious Weed (listed on M)

Table 3-104. Species Foliar Cover Summary at Locations A11-A15

Absolute Cover = The percentage of the number of hits on a species out of the total number of hits possible.

Absolute Cover = The percentage of the number  
Relative Cover = The percentage of the number

Relative Cover = The percentage of the number of Native Categories: Y = Native, N = Non-Native

Growth Form Categories: F = Forb, G = Graminoid

Cool/Warm Season Categories: C = Cool-Season Graminoid, W = Warm-Season Graminoid  
Noxious Weed Category: X = Noxious Weed (listed on May 2006 Colorado State Noxious Weed List)

Noxious Weed Category: X = Noxious Weed (listed on M  
Shaded cells indicate success criteria were met in 2007

Table 3-105. Species Foliar Cover Summary at Locations A16-A20

Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season	Noxious Weed	A16		A17		A18		A19		A20	
						Absolute Cover (%)	Relative Cover (%)								
<i>Alyssum alyssoides</i> (L.) L.	ALAL1	F	N			13.3	20.9	4.0	5.9	1.0	1.9	0.2	0.3	11.0	12.9
<i>Alyssum minus</i> (L.) Rothmaler var. <i>micranthus</i> (C. A. Mey.) Dudley	ALMI1	F	N												
<i>Barbarea vulgaris</i> R. Br.	BAVU1	F	N												
<i>Camelina microcarpa</i> Andr. ex DC.	CAMI1	F	N		X			4.0	5.9	4.0	7.8			1.3	1.5
<i>Centaurea diffusa</i> Lam.	CEDI1	F	N												
<i>Chenopodium album</i> L.	CHAL1	F	N									0.3	0.5		
<i>Cirsium arvense</i> (L.) Scop.	CIAR1	F	N		X										
<i>Convolvulus arvensis</i> L.	COAR1	F	N		X	1.8	2.8							1.0	1.2
<i>Cynoglossum officinale</i> L.	CYOF1	F	N		X										
<i>Dyssodia papposa</i> (Vent.) Hitchc.	DYPA1	F	N					0.3	0.4	0.3	0.5				
<i>Erodium cicutarium</i> (L.) L'Her.	ERC11	F	N		X	5.8	9.1	15.0	22.3	17.8	34.5	0.2	0.3	2.5	2.9
<i>Hypericum perforatum</i> L.	HYPE1	F	N		X			0.3	0.4						
<i>Kochia scoparia</i> (L.) Schrad.	KOSC1	F	N					1.0	1.5	0.3	0.5			0.3	0.3
<i>Lactuca serriola</i> L.	LASE1	F	N					2.3	3.3	2.5	4.9			0.5	0.6
<i>Lepidium campestre</i> (L.) R. Br.	LECA1	F	N												
<i>Linaria dalmatica</i> (L.) Mill.	LIDA1	F	N		X										
<i>Melilotus alba</i> Medic.	MEAL1	F	N												
<i>Melilotus officinalis</i> (L.) Pall.	MEOF1	F	N			23.0	36.2	0.5	0.7	6.3	12.1			0.3	0.3
<i>Medicago sativa</i> L. ssp. <i>sativa</i>	MESA1	F	N												
<i>Plantago lanceolata</i> L.	PLLA1	F	N												
<i>Plantago major</i> L.	PLMA1	F	N												
<i>Polygonum arenastrum</i> Jord. ex Bor.	POAR1	F	N												
<i>Polygonum persicaria</i> L.	POPE2	F	N												
<i>Rumex crispus</i> L.	RUCR1	F	N					0.3	0.4						
<i>Salsola iberica</i> Senn. & Pau.	SAIB1	F	N					0.3	0.4						
<i>Scorzonera laciniata</i> L.	SCLA1	F	N												
<i>Sisymbrium altissimum</i> L.	SIAL1	F	N												
<i>Sonchus arvensis</i> L. ssp. <i>arvensis</i> L.	SOAR1	F	N		X										
<i>Taraxacum officinale</i> Weber	TAOF1	F	N												
<i>Thlaspi arvense</i> L.	THAR1	F	N											0.3	0.3
<i>Tragopogon dubius</i> Scop.	TRDU1	F	N												
<i>Verbascum thapsus</i> L.	VETH1	F	N		X			0.5	0.7						
<i>Agrostis scabra</i> Willd.	AGSC1	F	Y												
<i>Ambrosia artemisiifolia</i> L.	AMAR1	F	Y					2.0	3.0	0.5	1.0				
<i>Ambrosia psilostachya</i> DC.	AMPS1	F	Y												
<i>Artemisia dracunculus</i> L.	ARDR1	F	Y												
<i>Aster falcatus</i> Lindl.	ASFA1	F	Y												
<i>Aster porteri</i> Gray	ASPO1	F	Y												
<i>Chenopodium fremontii</i> S. Wats.	CHFR1	F	Y												
<i>Chrysopsis villosa</i> Pursh.	CHV1	F	Y												
<i>Conyza canadensis</i> (L.) Cronq.	COCA1	F	Y												
<i>Dalea candida</i> Michx. ex Willd. var. <i>oligophylla</i> (Torr.) Shinners.	DACA1	F	Y												
<i>Descurainia pinnata</i> (Walt.) Britt.	DEPI1	F	Y												
<i>Descurainia richardsonii</i> (Sweet) Schultz	DERI1	F	Y												
<i>Erigeron divergens</i> T. & G.	ERDI1	F	Y					0.3	0.4						
<i>Euphorbia serpyllifolia</i> Pers.	EUSE1	F	Y												
<i>Grindelia squarrosa</i> (Pursh.) Dun.	GRSQ1	F	Y							0.3	0.5				
<i>Gutierrezia sarothrae</i> (Pursh.) Britt. & Rusby	GUSA1	F	Y												
<i>Helianthus annuus</i> L.	HEAN1	F	Y							0.3	0.5	0.2	0.3		
<i>Lepidium densiflorum</i> Schrad.	LEDE1	F	Y					0.5	0.7					10.3	12.0
<i>Lippia cuneifolia</i> (Torr.) Steud.	LICU1	F	Y												
<i>Linum perenne</i> L. var. <i>lewisii</i> (Pursh.) Eat. & Wright	LIPE1	F	Y												
<i>Mirabilis linearis</i> (Pursh.) Heimerl	MILI1	F	Y												
<i>Oenothera villosa</i> Thunb. ssp. <i>strigosa</i> (Rydb.) Dietrich & Raven	OEVI1	F	Y												
<i>Potentilla gracilis</i> Dougl. ex Hook. var. <i>glabrata</i> (Lehm.) C. L. Hitchc.	POGR1	F	Y												
<i>Psoralea tenuiflora</i> Pursh.	PSTE1	F	Y												
<i>Ratibida columnifera</i> (Nutt.) Woot. & Standl.	RACO1	F	Y												
<i>Rumex maritimus</i> L.	RUMA1	F	Y												
<i>Senecio plattensis</i> Nutt.	SEPL1	F	Y												
<i>Silene antirrhina</i> L.	SIAN1	F	Y												
<i>Solanum triflorum</i> Nutt.	SOTR1	F	Y							0.3	0.5				
<i>Verbena bracteata</i> Lag. & Rodr.	VEBR1	F	Y							0.8	1.5		0.3	0.3	
<i>Veronica peregrina</i> L. var. <i>xalapensis</i> (H. B. K.) St. John & Warren	VEPE1	F	Y												
<i>Xanthium strumarium</i> L.	XAST1	F	Y												
<i>Aegilops cylindrica</i> Host	AECY1	G	N	C	X										
<i>Agropyron cristatum</i> (L.) Gaertn.	AGCR1	G	N	C											
<i>Agropyron desertorum</i> (Fisch.) Schult.	AGDE1	G	N	C										0.2	0.3
<i>Agropyron intermediate</i> (Host) Beauv.	AGIN1	G	N	C		1.8	2.8			0.3	0.4	1.0	1.9		
<i>Agropyron repens</i> (L.) Beauv.	AGRE1	G	N	C	X					0.3	0.5				
<i>Agrostis stolonifera</i> L.	AGST1	G	N	C											
<i>Bromus inermis</i> Leyss. ssp. <i>inermis</i>	BRIN1	G	N	C											

Table 3-106. Species Foliar Cover Summary at Locations A21-A25

Absolute Cover = The percentage of the number of hits on a species out of the total number of hits possible.  
Relative Cover = The percentage of the number of hits on a species out of the total number of vegetation hits.

Relative Cover = The percentage of the number of Native Categories: Y = Native, N = Non-Native

Native Categories: Y = Native, N = Non-Native  
Growth Form Categories: F = Forb, G = Graminoid

Growth Form Categories: F = Forb, G = Graminoid  
Cool/Warm Season Categories: C = Cool-Season Graminoid, W = Warm-Season Graminoid

Noxious Weed Category: X = Noxious Weed (listed on M)

*Table 3-107. Species Foliar Cover Summary at Locations A26-A30*

Absolute Cover – The percentage of the number of hits on a species out of the total number of hits possible

Absolute Cover = The percentage of the number of hits on a species out of the total number of hits possible.  
Relative Cover = The percentage of the number of hits on a species out of the total number of vegetation hits.

Native Categories: Y = Native, N = Non-Native

Growth Form Categories: F = Forb, G = Graminoid

Cool/Warm Season Categories: C = Cool-Season Graminoid, W = Warm-Season Graminoid  
 N = non-W + C, T = X, N = non-W, and  $\Sigma$  = M - 2000 Cool-Season Non-W + Warm-Habitat

Noxious Weed Category: X = Noxious Weed (listed on M)  
Shaded cells indicate success criteria were met in 2007.

Table 3-108. Species Foliar Cover Summary at Locations A33-A35

Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season	Noxious Weed	A33		A34		A35	
						Absolute Cover (%)	Relative Cover (%)	Absolute Cover (%)	Relative Cover (%)	Absolute Cover (%)	Relative Cover (%)
<i>Alyssum alyssoides</i> (L.) L.	ALAL1	F	N							0.1	0.3
<i>Alyssum minus</i> (L.) Rothmaler var. <i>miranthus</i> (C. A. Mey.) Dudley	ALMI1	F	N			0.1	0.3			0.1	0.3
<i>Barbarea vulgaris</i> R. Br.	BAVU1	F	N								
<i>Camelina microcarpa</i> Andr. ex DC.	CAMI1	F	N								
<i>Centaurea diffusa</i> Lam.	CEDI1	F	N		X	3.6	7.6			5.4	11.1
<i>Chenopodium album</i> L.	CHAL1	F	N			0.1	0.3	0.1	0.3		
<i>Cirsium arvense</i> (L.) Scop.	CIAR1	F	N		X						
<i>Convolvulus arvensis</i> L.	COAR1	F	N		X						
<i>Cynoglossum officinale</i> L.	CYOF1	F	N		X						
<i>Dyssodia papposa</i> (Vent) Hitchc.	DYPD1	F	N								
<i>Erodium cicutarium</i> (L.) L'Her.	ERCI1	F	N		X	0.4	0.8			1.1	2.3
<i>Hypericum perforatum</i> L.	HYPE1	F	N		X						
<i>Kochia scoparia</i> (L.) Schrad.	KOSC1	F	N			19.3	40.4	20.5	42.1	10.0	20.7
<i>Lactuca serriola</i> L.	LASE1	F	N			2.5	5.2	1.3	2.6	4.0	8.3
<i>Lepidium campestre</i> (L.) R. Br.	LECA1	F	N								
<i>Linaria dalmatica</i> (L.) Mill.	LIDA1	F	N		X						
<i>Melilotus alba</i> Medic.	MEAL1	F	N								
<i>Melilotus officinalis</i> (L.) Pall.	MEOF1	F	N			0.1	0.3	1.5	3.1	1.8	3.6
<i>Medicago sativa</i> L. ssp. <i>sativa</i>	MESA1	F	N								
<i>Plantago lanceolata</i> L.	PLLA1	F	N								
<i>Plantago major</i> L.	PLMA1	F	N								
<i>Polygonum arenastrum</i> Jord. ex Bor.	POAR1	F	N			4.5	9.4	11.8	24.1	1.4	2.8
<i>Polygonum persicaria</i> L.	POPE2	F	N								
<i>Rumex crispus</i> L.	RUCR1	F	N								
<i>Salsola iberica</i> Senn. & Pau.	SAIB1	F	N			0.8	1.6	0.3	0.5	0.9	1.8
<i>Scorzonera laciniata</i> L.	SCLA1	F	N								
<i>Sisymbrium altissimum</i> L.	SIAL1	F	N			0.3	0.5			0.1	0.3
<i>Sonchus arvensis</i> L. ssp. <i>arvensis</i> L.	SOAR1	F	N		X	0.1	0.3				
<i>Taraxacum officinale</i> Weber	TAOF1	F	N								
<i>Thlaspi arvense</i> L.	THAR1	F	N								
<i>Tragopogon dubius</i> Scop.	TRDU1	F	N								
<i>Verbascum thapsus</i> L.	VETH1	F	N		X						
<i>Agrostis scabra</i> Willd.	AGSC1	F	Y								
<i>Ambrosia artemisiifolia</i> L.	AMAR1	F	Y			1.0	2.1	0.3	0.5	0.9	1.8
<i>Ambrosia psilostachya</i> DC.	AMPS1	F	Y					0.1	0.3		
<i>Artemisia dracunculus</i> L.	ARDR1	F	Y								
<i>Aster falcatus</i> Lindl.	ASFA1	F	Y								
<i>Aster porteri</i> Gray	ASPO1	F	Y								
<i>Chenopodium fremontii</i> S. Wats.	CHFR1	F	Y								
<i>Chrysopsis villosa</i> Pursh.	CHV11	F	Y								
<i>Conyza canadensis</i> (L.) Cronq.	COCA1	F	Y								
<i>Datea candida</i> Michx. ex Willd. var. <i>oligophylla</i> (Torr.) Shinners.	DACA1	F	Y								
<i>Descurainia pinnata</i> (Walt.) Britt.	DEPI1	F	Y								
<i>Descurainia richardsonii</i> (Sweet) Schultz	DERI1	F	Y								
<i>Erigeron divergens</i> T. & G.	ERDI1	F	Y								
<i>Euphorbia serpyllifolia</i> Pers.	EUSE1	F	Y								
<i>Grindelia squarrosa</i> (Pursh.) Dun.	GRSQ1	F	Y			0.4	0.8	0.3	0.5	0.3	0.5
<i>Gutierrezia sarothrae</i> (Pursh.) Britt. & Rusby	GUSA1	F	Y								
<i>Helianthus annuus</i> L.	HEAN1	F	Y			1.4	2.9	0.1	0.3	2.3	4.7
<i>Lepidium densiflorum</i> Schrad.	LEDE1	F	Y								
<i>Lippia cuneifolia</i> (Torr.) Steud.	LICU1	F	Y								
<i>Linum perenne</i> L. var. <i>lewisii</i> (Pursh.) Eat. & Wright	LIPE1	F	Y								
<i>Mirabilis linearis</i> (Pursh.) Heimerl	MIL1	F	Y								
<i>Oenothera villosa</i> Thunb. ssp. <i>strigosa</i> (Rydb.) Dietrich & Raven	OEV1	F	Y								
<i>Potentilla gracilis</i> Dougl. ex Hook. var. <i>glabrata</i> (Lehm.) C. L. Hitchc.	POGR1	F	Y								
<i>Psoralea tenuiflora</i> Pursh.	PSTE1	F	Y								
<i>Ratibida columnifera</i> (Nutt.) Woot. & Standl.	RACO1	F	Y								
<i>Rumex maritimus</i> L.	RUMA1	F	Y								
<i>Senecio plattensis</i> Nutt.	SEPL1	F	Y								
<i>Silene antirrhina</i> L.	SIAN1	F	Y								
<i>Solanum triflorum</i> Nutt.	SOTR1	F	Y								
<i>Verbena bracteata</i> Lag. & Rodr.	VEBR1	F	Y			0.1	0.3				
<i>Veronica peregrina</i> L. var. <i>xalapensis</i> (H. B. K.) St. John & Warren	VEPE1	F	Y								
<i>Xanthium strumarium</i> L.	XAST1	F	Y								
<i>Aegilops cylindrica</i> Host	AECY1	G	N	C	X						
<i>Agropyron cristatum</i> (L.) Gaertn.	AGCR1	G	N	C							
<i>Agropyron desertorum</i> (Fisch.) Schult.	AGDE1	G	N	C							
<i>Agropyron intermedium</i> (Host) Beauv.	AGIN1	G	N	C							
<i>Agropyron repens</i> (L.) Beauv.	AGRE1	G	N	C	X						
<i>Agrostis stolonifera</i> L.	AGST1	G	N	C							
<i>Bromus inermis</i> Leyss. ssp. <i>inermis</i>	BRIN1	G	N	C		0.3	0.5	0.1	0.3	0.9	1.8
<i>Bromus japonicus</i> Thunb. ex Murr.	BRJA1	G	N	C							
<i>Bromus tectorum</i> L.	BRTE1	G	N	C	X	0.1	0.3	0.1	0.3	0.3	0.5
<i>Dactylis glomerata</i> L.	DAGL1	G	N	C							
<i>Festuca pratensis</i> Huds.	FEP1	G	N	C						0.8	1.6
<i>Lolium perenne</i> L. var. <i>aristatum</i> Willd.	LOPE1	G	N	C							
<i>Poa compressa</i> L.	POC1	G	N	C							
<i>Poa pratensis</i> L.	POPR1	G	N	C							
<i>Schedonardus paniculatus</i> (Nutt.) Trel.	SCPA2	G	N	C							
<i>Triticum aestivum</i> L.	TRA1	G	N	C				5.6	11.5	0.1	0.3
<i>Echinochloa crusgalli</i> (L.) Beauv.	ECCR1	G	N	W							
<i>Setaria viridis</i> (L.) Beauv.	SEV1	G	N	W							
<i>Agropyron caninum</i> (L.) Beauv. ssp. <i>majus</i> (Vasey) C. L. Hitchc.	AGCA1	G	Y	C		8.6	18.1	5.0	10.3	11.8	24.3
<i>Agropyron dasystachyum</i> (Hook.) Scribn.	AGDA1	G	Y	C							
<i>Agropyron Griffithsii</i> Scribn. & Smith	AGGR1	G	Y	C							
<i>Agropyron smithii</i> Rydb.	AGSM1	G	Y	C		3.3	6.8	1.5	3.1	4.3	8.8
<i>Elymus canadensis</i> L.	ELCA1	G	Y	C							

Table 3-109. Species Foliar Cover Summary at Locations A36–A40

Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season	Noxious Weed	A36		A37		A38		A39		A40	
						Absolute Cover (%)	Relative Cover (%)								
<i>Alyssum alyssoides</i> (L.) L.	ALAL1	F	N			0.1	0.2			0.1	0.2				
<i>Alyssum minus</i> (L.) Rothmaler var. <i>micranthus</i> (C. A. Mey.)	ALMI1	F	N												
<i>Barbarea vulgaris</i> R. Br.	BAVU1	F	N												
<i>Camelina microcarpa</i> Andr. ex DC.	CAMI1	F	N		X	0.1	0.2	1.1	3.1	0.3	0.4	0.5	1.1		
<i>Centaura diffusa</i> Lam.	CEDI1	F	N			0.6	1.1			1.3	1.8				
<i>Chenopodium album</i> L.	CHAL1	F	N												
<i>Cirsium arvense</i> (L.) Scop.	CIAR1	F	N		X										
<i>Convolvulus arvensis</i> L.	COAR1	F	N		X										
<i>Cynoglossum officinale</i> L.	CYOF1	F	N		X										
<i>Dyssodia papposa</i> (Vent.) Hitchc.	DYPA1	F	N												
<i>Erodium cicutarium</i> (L.) L'Her.	ERCI1	F	N		X					0.5	0.7				
<i>Hypericum perforatum</i> L.	HYPE1	F	N		X										
<i>Kochia scoparia</i> (L.) Schrad.	KOSC1	F	N			15.3	27.5	16.1	43.9	22.9	33.4	9.9	21.7	33.4	75.6
<i>Lactuca serriola</i> L.	LASE1	F	N			1.3	2.3	1.3	3.4	0.9	1.3	0.3	0.5		
<i>Lepidium campestre</i> (L.) R. Br.	LECA1	F	N		X										
<i>Linaria dalmatica</i> (L.) Mill.	LIDA1	F	N												
<i>Melilotus alba</i> Medic.	MEAL1	F	N												
<i>Melilotus officinalis</i> (L.) Pall.	MEOF1	F	N			0.1	0.2			2.8	4.0	1.4	3.0		
<i>Medicago sativa</i> L. ssp. <i>sativa</i>	MESA1	F	N												
<i>Plantago lanceolata</i> L.	PLLA1	F	N					0.3	0.7			0.1	0.3		
<i>Plantago major</i> L.	PLMA1	F	N												
<i>Polygonum arenastrum</i> Jord. ex Bor.	POAR1	F	N			9.8	17.6	5.5	15.0	1.8	2.6	15.0	33.0	1.0	2.3
<i>Polygonum perfoliatum</i> L.	POPE2	F	N									0.1	0.3		
<i>Rumex crispus</i> L.	RUCR1	F	N												
<i>Salsola iberica</i> Senn. & Pau.	SAIB1	F	N			3.4	6.1	2.6	7.1	3.9	5.7	9.1	20.1	0.3	0.6
<i>Scorzonera laciniata</i> L.	SCLA1	F	N												
<i>Sisymbrium altissimum</i> L.	SIAL1	F	N												
<i>Sonchus arvensis</i> L. ssp. <i>arvensis</i> L.	SOAR1	F	N		X	0.1	0.2								
<i>Taraxacum officinale</i> Weber	TAOF1	F	N												
<i>Thlaspi arvense</i> L.	THAR1	F	N							0.1	0.2				
<i>Tragopogon dubius</i> Scop.	TRDU1	F	N												
<i>Verbascum thapsus</i> L.	VETH1	F	N		X										
<i>Agrostis scabra</i> Willd.	AGSC1	F	Y												
<i>Ambrosia artemisiifolia</i> L.	AMAR1	F	Y			0.1	0.2	0.1	0.3	0.1	0.2		0.1	0.3	
<i>Ambrosia psilostachya</i> DC.	AMPS1	F	Y												
<i>Artemisia dracunculus</i> L.	ARDR1	F	Y												
<i>Aster falcatus</i> Lindl.	ASFA1	F	Y												
<i>Aster porteri</i> Gray	ASPO1	F	Y												
<i>Chenopodium fremontii</i> S. Wats.	CHFR1	F	Y									0.1	0.3		
<i>Chrysopsis villosa</i> Pursh.	CHVI1	F	Y												
<i>Conyza canadensis</i> (L.) Cronq.	COCA1	F	Y												
<i>Dalea candida</i> Michx. ex Willd. var. <i>oligophylla</i> (Torr.) Shinn	DACA1	F	Y												
<i>Descurainia pinnata</i> (Walt.) Britt.	DEPI1	F	Y												
<i>Descurainia richardsonii</i> (Sweet) Schultz	DERI1	F	Y												
<i>Erigeron divergens</i> T. & G.	ERDI1	F	Y												
<i>Euphorbia serpyllifolia</i> Pers.	EUSE1	F	Y												
<i>Grindelia squarrosa</i> (Pursh.) Dun.	GRSQ1	F	Y												
<i>Gutierrezia sarothrae</i> (Pursh.) Britt. & Rusby	GUSA1	F	Y												
<i>Helianthus annuus</i> L.	HEAN1	F	Y			0.3	0.5					0.8	1.6		
<i>Lepidium densiflorum</i> Schrad.	LEDE1	F	Y												
<i>Lippia cuneifolia</i> (Torr.) Steud.	LICU1	F	Y												
<i>Linum perenne</i> L. var. <i>lewisii</i> (Pursh.) Eat. & Wright	LIPE1	F	Y												
<i>Mirabilis linearis</i> (Pursh.) Heimerl	MIL1	F	Y												
<i>Oenothera villosa</i> Thunb. ssp. <i>strigosa</i> (Rydb.) Dietrich & R.	OEVI1	F	Y												
<i>Potentilla gracilis</i> Dougl. ex Hook. var. <i>glabrata</i> (Lehm.) C. L.	POGR1	F	Y												
<i>Psoralea tenuiflora</i> Pursh.	PSTE1	F	Y												
<i>Ratibida columnifera</i> (Nutt.) Woot. & Standl.	RACO1	F	Y												
<i>Rumex maritimus</i> L.	RUMA1	F	Y												
<i>Senecio plattensis</i> Nutt.	SEPL1	F	Y												
<i>Silene antirrhina</i> L.	SIAN1	F	Y							0.1	0.2				
<i>Solanum triflorum</i> Nutt.	SOTR1	F	Y												
<i>Verbena bracteata</i> Lag. & Rodr.	VEBR1	F	Y							0.1	0.2				
<i>Veronica peregrina</i> L. var. <i>xalapensis</i> (H. B. K.) St. John & V.	VEP1	F	Y							0.3	0.4				
<i>Xanthium strumarium</i> L.	XAST1	F	Y												
<i>Aegilops cylindrica</i> Host	AECY1	G	N	C	X			0.1	0.3	1.9	2.7				
<i>Agropyron cristatum</i> (L.) Gaertn.	AGCR1	G	N	C								0.1	0.2		
<i>Agropyron desertorum</i> (Fisch.) Schult.	AGDE1	G	N	C											
<i>Agropyron intermedium</i> (Host) Beauvois	AGIN1	G	N	C								0.8	1.1		
<i>Agropyron repens</i> (L.) Beauvois	AGRE1	G	N	C	X										
<i>Agrostis stolonifera</i> L.	AGST1	G	N	C											
<i>Bromus inermis</i> Leyss. ssp. <i>inermis</i>	BRIN1	G	N	C			</								

Table 3-110. Success Criteria Evaluation Summary

Location	>30% Relative Cover of Desired Species	>70% Total Ground Cover (Litter, Rock, and Basal Veg Cover)	50% or More of Seeded Species Present	No Single Species With >45% Relative Foliar Cover	PASS/FAIL
A2	PASS	PASS	PASS	PASS	PASS
A3	PASS	PASS	FAIL	PASS	FAIL
A4	PASS	PASS	PASS	PASS	PASS
A5	PASS	FAIL	FAIL	PASS	FAIL
A6	PASS	PASS	PASS	PASS	PASS
A7	PASS	PASS	PASS	PASS	PASS
A8	PASS	PASS	PASS	FAIL	FAIL
A9	PASS	FAIL	PASS	PASS	FAIL
A10	PASS	PASS	FAIL	FAIL	FAIL
A11	FAIL	PASS	PASS	PASS	FAIL
A12	PASS	PASS	FAIL	PASS	FAIL
A14	PASS	FAIL	PASS	PASS	FAIL
A15	PASS	PASS	PASS	PASS	PASS
A16	FAIL	PASS	FAIL	PASS	FAIL
A17	PASS	PASS	PASS	PASS	PASS
A18	PASS	FAIL	PASS	PASS	FAIL
A19	PASS	PASS	FAIL	FAIL	FAIL
A20	PASS	PASS	FAIL	PASS	FAIL
A21	PASS	PASS	PASS	PASS	PASS
A22	PASS	PASS	PASS	PASS	PASS
A23	PASS	PASS	PASS	PASS	PASS
A24	FAIL	PASS	PASS	PASS	FAIL
A25	PASS	PASS	PASS	PASS	PASS
A26	PASS	PASS	FAIL	PASS	FAIL
A27	PASS	PASS	PASS	PASS	PASS
A28	PASS	PASS	PASS	PASS	PASS
A29	PASS	PASS	FAIL	PASS	FAIL
A30	FAIL	PASS	FAIL	PASS	FAIL
A33	PASS	PASS	PASS	PASS	PASS
A34	FAIL	PASS	FAIL	PASS	FAIL
A35	PASS	PASS	FAIL	PASS	FAIL
A36	FAIL	PASS	FAIL	PASS	FAIL
A37	FAIL	PASS	FAIL	PASS	FAIL
A38	PASS	PASS	FAIL	PASS	FAIL
A39	FAIL	PASS	FAIL	PASS	FAIL
A40	FAIL	PASS	FAIL	FAIL	FAIL
% Passing	75	89	53	89	36

*Table 3-111. Revegetation Location Information Table*

Location	Original Revegetation Date	Original Erosion Control	Additional Revegetation Effort Date	Amendments Added	New Erosion Control
A2	Summer/Fall 2005	Crimped Straw			
A3	Fall 2004	Erosion Matting			
A4	Summer 2005	Flexterra			
A5	Summer/Fall 2005	Crimped Straw			
A6	Spring 2004	Crimped Straw			
A7	Summer/Fall 2005	Flexterra/Crimped Straw			
A8	Spring 2005	Erosion Matting			
A9	Summer 2005	Crimped Straw			
A10	Spring 2003	Crimped Straw			
A11	Summer/Fall 2005	Crimped Straw			
A12	Spring 2005	Crimped Straw			
A14	Spring 2003	Crimped Straw			
A15	Spring 2005	Hydromulch/Erosion Matting			
A16	Summer 2005	Crimped Straw			
A17	Summer 2005	Flexterra			
A18	Spring 2005	Flexterra			
A19	Spring 2005	Hydromulch/Erosion Matting			
A20	Summer 2002	Hydromulch			
A21	Summer 2005	Flexterra			
A22	Summer 2004	Erosion Matting			
A23	Spring 2005	Erosion Matting			
A24	Winter 2003	Hydromulch			
A25	Summer 2005	Straw/Flexterra/Erosion Matting			
A26	NA		Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A27	NA		Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A28	NA		Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A29	Spring 2005	Crimped Straw	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A30	Spring 2005	Crimped Straw	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A33	Summer 2005	Flexterra	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A34	Summer/Fall 2005	Crimped Straw	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A35	Summer 2005	Flexterra	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A36	Summer/Fall 2005	Crimped Straw	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A37	Summer/Fall 2005	Crimped Straw	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A38	Summer/Fall 2005	Crimped Straw	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A39	Summer/Fall 2005	Crimped Straw	Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra
A40	NA		Spring 2007	Compost, Biosol, Mycorrhizal Inoculent	Flexterra

*Table 3-112. Basal Cover Summary at Revegetation Locations\**

Location	Basal Vegetation Cover (%)	Litter Cover (%)	Rock Cover (%)	Total Ground Cover (%)*	Bare Ground (%)
A2	2.9	17.7	67.5	88.1	11.9
A3	3.8	64.3	12.3	80.3	19.8
A4	3.8	22.0	52.9	78.7	21.3
A5	3.3	9.4	49.5	62.3	37.8
A6	6.3	17.0	68.8	92.0	8.0
A7	2.9	7.3	60.0	70.2	29.8
A8	6.3	61.0	36.8	104.0	0.0
A9	3.6	29.9	25.3	58.8	41.3
A10	6.3	93.8	2.5	102.5	0.0
A11	2.9	28.8	55.3	86.9	13.1
A12	3.8	36.4	35.8	75.9	24.1
A14	8.8	17.0	40.0	65.8	34.3
A15	12.3	49.2	45.0	106.5	0.0
A16	2.5	20.5	47.8	70.8	29.3
A17	13.8	14.5	63.0	91.3	8.8
A18	3.8	8.5	54.8	67.0	33.0
A19	13.3	68.8	14.8	97.0	3.0
A20	10.0	68.8	5.8	84.5	15.5
A21	3.1	24.0	46.6	73.8	26.3
A22	10.3	65.0	23.9	99.2	0.8
A23	3.5	87.8	11.0	102.3	0.0
A24	7.5	95.0	1.0	103.5	0.0
A25	3.9	63.9	30.4	98.2	1.8
A26	2.4	64.6	35.4	102.4	0.0
A27	3.1	78.8	18.8	100.6	0.0
A28	2.5	65.8	22.9	91.1	8.9
A29	2.5	74.0	13.5	90.0	10.0
A30	3.1	80.0	16.8	99.9	0.1
A33	3.1	49.0	46.1	98.3	1.8
A34	2.5	85.9	12.9	101.3	0.0
A35	2.5	65.9	27.9	96.3	3.8
A36	2.5	62.1	30.4	95.0	5.0
A37	2.5	80.9	20.3	103.6	0.0
A38	7.5	62.0	28.9	98.4	1.6
A39	2.5	79.9	19.5	101.9	0.0
A40	2.5	82.3	17.1	101.9	0.0
Grand Mean	4.9	52.8	32.2	90.0	10.9

\* Numbers greater than 100 are an artifact of the sampling method using a cover class system and midpoints for analysis.

The Total Ground Cover value is the sum of the Basal Vegetation Cover, Litter Cover, and Rock Cover.

A third success criterion outlined in the Revegetation Plan states that a minimum of 30 percent relative cover of desired species must be present, and a fourth criterion states that no single species should comprise more than 45 percent of the total relative cover. Table 3-102, Table 3-103, Table 3-104, Table 3-105, Table 3-106, Table 3-107, Table 3-108, and Table 3-109 summarize the foliar cover data by location for 2007. The shaded row titled Total Herbaceous Native Cover at the bottom of each table shows the percent cover of desired species at each location. The values that are higher than 30 percent at each revegetation location are shaded, indicating that these locations have met this success criterion. Total relative vegetation cover of desired (native) species was greater than 30 percent at 27 of the 36 locations monitored in 2007. Only 4 of the 36 revegetation locations had a single species that comprised greater than 45 percent of the relative cover (locations A8, A10, A19, and A40). Locations A8 and A19 were dominated by slender wheatgrass, one of the early successional seeded native species (49 percent and 60 percent, respectively). In time, this short-lived perennial native species should be replaced by the other native graminoids planted in the seed mix. At location A10, western wheatgrass, a native seeded species, has become dominant (54 percent), and is outcompeting the other seeded native species. In time this may change. At location A40, kochia was the dominant species in 2007, comprising 76 percent of the total vegetation cover at this location. Location A40 was revegetated in early spring 2007, and soil amendments were used to improve the quality of the substrate. The kochia is not a surprise, since it is commonly one of the species that dominate new revegetation areas at the Site during the first growing season. It should decrease in 2008 as other species establish and compete with it for resources.

Besides kochia, other dominant species at the revegetation locations include common weedy, early successional species such as wild lettuce, yellow sweet clover, Russian thistle, filaree, alyssum (*Alyssum minus*), devil's shoestring (knotweed; *Polygonum arenastrum*), annual ragweed (*Ambrosia artemisifolia*), and diffuse knapweed, a noxious weed. Most of these species will disappear on their own after a year or two as the desired seeded species outcompete them for resources and begin to establish more abundantly. Weeds such as diffuse knapweed will need to be controlled through weed control efforts, which will be done as part of the normal vegetation management operations at the Site.

Table 3-110 presents a summary of the pass/fail criteria for each revegetation location monitored in 2007. Thirteen of the 36 locations (36 percent) passed all four criteria in 2007. It is not unexpected that most failed to meet all the success criteria, as it often takes 5 or 6 years to establish a good stand of vegetation. In addition, the success criteria listed in the Revegetation Plan are an initial set of criteria established primarily for erosion protection. As stated in the Revegetation Plan, these "...criteria are provided as initial guidance; however, common sense combined with scientific data will need to be applied to final evaluations to determine whether further management actions are required at specific locations." Also, although some of the areas passed each of the criteria listed in the Revegetation Plan, this does not necessarily mean that the vegetation has established to a desirable level at these locations as of 2007. Some of the revegetation locations may require some reseeding and weed control. Proactive management of the revegetation areas is critical to success. These data are useful for making management decisions and provide documentation of the successional changes at the revegetation locations. This documentation can be used to help improve revegetation techniques at the Site.

### 3.3.2.5 PLF and OLF Monitoring

As part of the cleanup and closure of the Site, two landfills were covered using different types of covers. At the PLF, a RCRA Subtitle C-compliant cover was constructed to protect the underlying waste. At the OLF, a 2-foot-thick soil cover was placed over the waste material. Both areas were seeded with native plant species to provide a vegetation cover on each landfill. As part of the revegetation process, monitoring is conducted to evaluate the status of the vegetation. The Revegetation Plan (DOE 2005b) provides initial success criteria for revegetation areas at the Site. As stated in the plan the success criteria contained therein are simply initial guidance and may be modified using professional judgment, scientific data, and common sense to determine whether the vegetation establishment at a given location is acceptable for the specific location(s). This section summarizes revegetation monitoring results for data collected at the PLF and OLF during 2007.

The methods used for the revegetation monitoring on the PLF and OLF are provided in the full report on the Ecology DVD at the end of this report. Figure 3-243 shows the locations at the Site where revegetation monitoring was conducted in 2007.

Table 3-113 presents the species richness in 2007 at both the PLF and OLF. Total species richness was 34 species at the PLF and 25 species at the OLF. The difference in numbers between the PLF and OLF is largely related to the environmental conditions at each location. The OLF is on a south-facing hillside, where soil is much drier than soil at the PLF. The 2006 drought also affected the OLF more than the PLF as a result of the slope aspect. Therefore, germination and vegetation establishment has been less because of the harsher conditions. Also, the overabundance of erosion control materials initially installed on the OLF (straw with Flexterra applied on top) has hindered germination and establishment of the seeded species. Several locations still remain where the thickness of the erosion controls inhibits germination. Until this material breaks down, little growth is expected. Table 3-114 lists the species that were seeded at each landfill. At the PLF and OLF, a total of eight and five seed species were present, respectively, in 2007. One of the success criteria in the Revegetation Plan states that at least 50 percent of the seeded species must be present in an area for it to be considered successful. Based on an evaluation by sampling location, only the western portion of the PLF cover did not meet this criterion in 2007 (Table 3-114).

Ground cover protection from rock, litter, and current-year live vegetation was above 95 percent at both the PLF and OLF (Table 3-115). The occasional value over 100 percent is a result of the cover class system used for estimating cover, which estimates cover values into a range and uses the midpoint of the cover class for analysis. Another success criterion outlined in the Revegetation Plan states that a minimum of 70 percent total ground cover consisting of litter cover, current-year live vegetation basal cover, and rock cover is to be present to help prevent erosion. At each of the locations on the PLF and OLF, most of the ground cover came from litter, of which a portion is represented by the erosion matting. In time, the litter cover will continue to remain the dominant ground cover, but it will come from dead plant material that becomes matted down, rather than from the erosion matting. The conclusion is that the covers at both landfills have substantial protection on the soil surface to prevent erosion.

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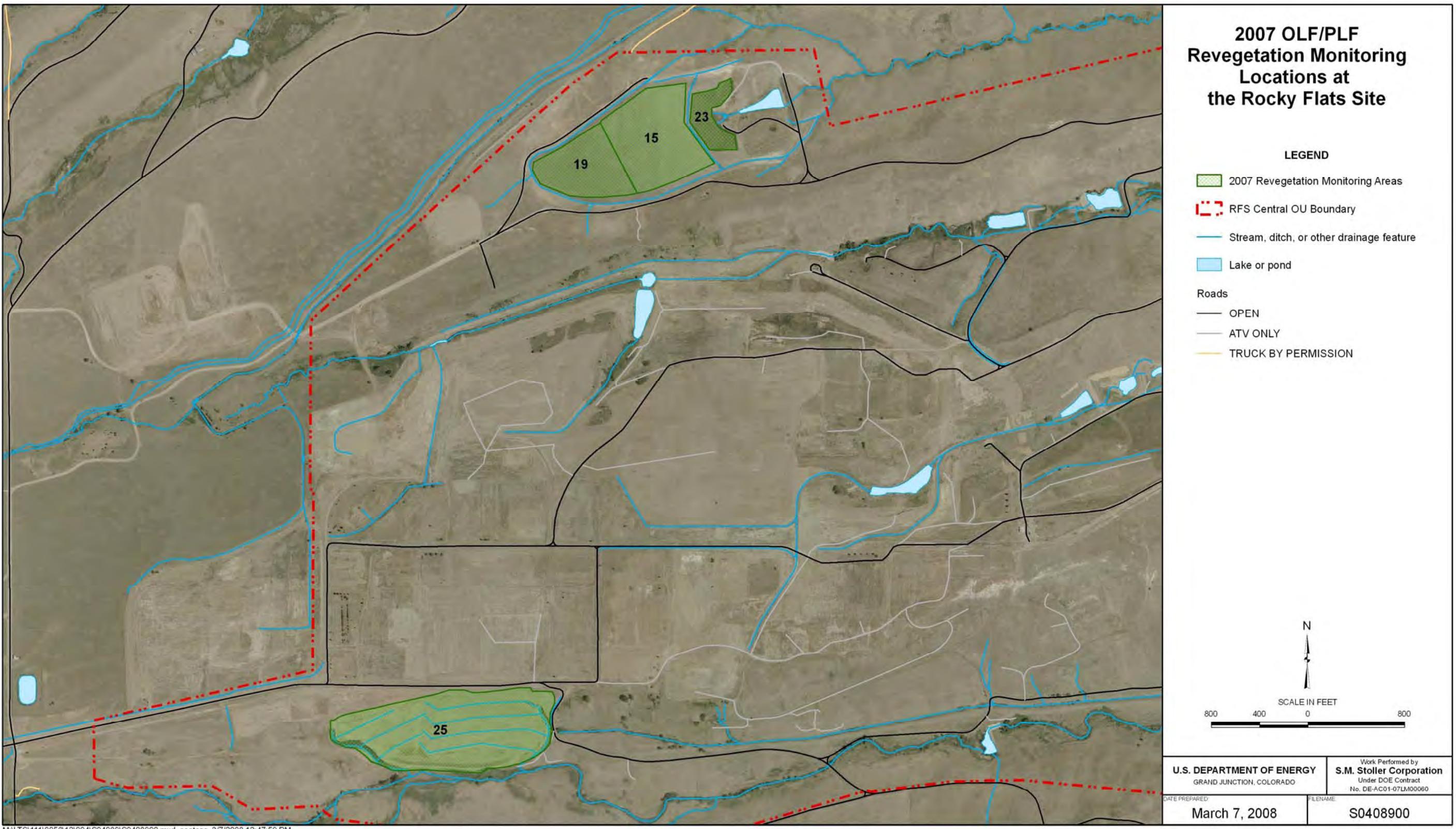


Figure 3-243. 2007 OLF and PLF Revegetation Monitoring Locations at the Rocky Flats Site

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Table 3-113. 2007 Species Richness and Foliar Cover Summary at the PLF and OLF

Scientific Name	Speccode	Growth Form	Native	Cool/Warm Season	Noxious Weed	East PLF Cover		West PLF Cover		East Face PLF		OLF Cover	
						A15		A19		A23		A25	
						Absolute Cover (%)	Relative Cover (%)						
<i>Alyssum minus</i> (L.) Rothmaler var. <i>micranthus</i> (C. A. Mey.) Dudley	ALMI1	F	N		X	0.3	1.0	0.2	0.3			0.6	1.7
<i>Centaurea diffusa</i> Lam.	CEDI1	F	N		X	1.0	2.9			1.8	7.8	3.9	10.8
<i>Cirsium arvense</i> (L.) Scop.	CIAR1	F	N		X								
<i>Erodium cicutarium</i> (L.) L'Her.	ERCI1	F	N		X			0.2	0.3			0.1	0.2
<i>Kochia scoparia</i> (L.) Schrad.	KOSC1	F	N									1.9	5.3
<i>Lactuca serriola</i> L.	LASE1	F	N			0.3	1.0			4.3	18.9	1.6	4.3
<i>Melilotus alba</i> Medic.	MEAL1	F	N									1.8	5.0
<i>Melilotus officinalis</i> (L.) Pall.	MEOF1	F	N			0.7	1.9					1.2	3.4
<i>Salsola iberica</i> Senn. & Pau.	SAIB1	F	N							1.5	6.7	1.6	4.6
<i>Taraxacum officinale</i> Weber	TAOF1	F	N			0.2	0.5					0.1	0.2
<i>Thlaspi arvense</i> L.	THAR1	F	N			0.2	0.5						
<i>Tragopogon dubius</i> Scop.	TRDU1	F	N			0.3	1.0						
<i>Ambrosia psilostachya</i> DC.	AMPS1	F	Y			0.5	1.4					0.1	0.2
<i>Conyza canadensis</i> (L.) Cronq.	COCA1	F	Y									0.2	0.5
<i>Erigeron divergens</i> T. & G.	ERDI1	F	Y			0.2	0.5						
<i>Euphorbia serpyllifolia</i> Pers.	EUSE1	F	Y							0.3	1.1		
<i>Grindelia squarrosa</i> (Pursh.) Dun.	GRSQ1	F	Y			0.2	0.5			1.5	6.7	0.2	0.5
<i>Helianthus annuus</i> L.	HEAN1	F	Y					0.2	0.3				
<i>Verbena bracteata</i> Lag. & Rodr.	VEBR1	F	Y			0.2	0.5						
<i>Agropyron desertorum</i> (Fisch.) Schult.	AGDE1	G	N	C				0.2	0.3				
<i>Agrostis stolonifera</i> L.	AGST1	G	N	C								0.1	0.2
<i>Bromus japonicus</i> Thunb. ex Murr.	BRJA1	G	N	C		1.2	3.4					0.2	0.5
<i>Bromus tectorum</i> L.	BRTE1	G	N	C	X	0.3	1.0	0.2	0.3			0.4	1.2
<i>Dactylis glomerata</i> L.	DAGL1	G	N	C				0.2	0.3				
<i>Festuca pratensis</i> Huds.	FEPR1	G	N	C		0.2	0.5						
<i>Poa compressa</i> L.	POCO1	G	N	C		2.2	6.3	7.3	12.9			0.5	1.4
<i>Poa pratensis</i> L.	POPR1	G	N	C				0.2	0.3				
<i>Triticum aestivum</i> L.	TRAЕ1	G	N	C								1.4	3.8
<i>Setaria viridis</i> (L.) Beauv.	SEVI1	G	N	W								0.2	0.5
<i>Agropyron caninum</i> (L.) Beauv. ssp. <i>majus</i> (Vasey) C. L. Hitchc.	AGCA1	G	Y	C		14.5	42.0	34.2	60.3	5.8	25.6	10.6	29.5
<i>Agropyron griffithii</i> Scribn. & Smith	AGGR1	G	Y	C				2.3	4.1				
<i>Agropyron smithii</i> Rydb.	AGSM1	G	Y	C		5.5	15.9	4.5	7.9	4.3	18.9	7.0	19.4
<i>Elymus canadensis</i> L.	ELCA1	G	Y	C				1.0	1.8				
<i>Hordeum jubatum</i> L.	HOJU1	G	Y	C				1.3	2.4				
<i>Koeleria pyramidata</i> (Lam.) Beauv.	KOPY1	G	Y	C		0.3	1.0	2.2	3.8				
<i>Sitanion hystrix</i> (Nutt.) Sm. var. <i>brevifolium</i> (Sm.) Hitchc.	SIHY1	G	Y	C								0.1	0.2
<i>Stipa viridula</i> Trin.	STVI1	G	Y	C		0.2	0.5	0.2	0.3				
<i>Andropogon gerardii</i> Vitman	ANGE1	G	Y	W		1.3	3.9	0.5	0.9				
<i>Andropogon scoparius</i> Michx.	ANSC1	G	Y	W								0.2	0.5
<i>Bouteloua curtipendula</i> (Michx.) Torr.	BOCU1	G	Y	W		1.2	3.4			3.0	13.3	1.6	4.3
<i>Bouteloua gracilis</i> (H. B. K.) Lag ex Griffiths	BOGR1	G	Y	W		0.2	0.5					0.2	0.5
<i>Buchloe dactyloides</i> (Nutt.) Engelm.	BUDA1	G	Y	W		3.5	10.1	2.0	3.5	0.3	1.1	0.4	1.2
Total Foliar Cover						34.5	100.0	56.7	100.0	22.5	100.0	35.9	100.0
Total Forb Cover						4.0	11.6	0.5	0.9	9.3	41.1	13.2	36.7
Total Non-Native Forb Cover						3.0	8.7	0.3	0.6	7.5	33.3	12.8	35.5
Total Native Forb Cover						1.0	2.9	0.2	0.3	1.8	7.8	0.4	1.2
Total Graminoid Cover						30.5	88.4	56.2	99.1	13.3	58.9	22.8	63.3
Total Non-Native Graminoid Cover						3.8	11.1	8.0	14.1	0.0	0.0	2.8	7.7
Total Native Graminoid Cover						26.7	77.3	48.2	85.0	13.3	58.9	20.0	55.6
<b>Total Herbaceous Native Cover</b>						27.7	80.2	48.3	85.3	15.0	66.7	20.4	<b>56.8</b>
Total Herbaceous Non-Native Cover						6.8	19.8	8.3	14.7	7.5	33.3	15.5	43.2
Total Warm-Season Graminoid Cover						6.2	17.9	2.5	4.4	3.3	14.4	2.5	7.0
Total Cool-Season Graminoid Cover						24.3	70.5	53.7	94.7	10.0	44.4	20.3	56.4
Total Noxious Weed Cover						1.7	4.8	0.3	0.6	1.8	7.8	4.4	12.2

Absolute Cover = The percentage of the number of hits on a species out of the total number of hits possible.

Relative Cover = The percentage of the number of hits on a species out of the total number of vegetation hits.

Native Categories: Y = Native, N = Non-Native

Growth Form Categories: F = Forb, G = Graminoid

Cool/Warm Season Categories: C = Cool-Season Graminoid, W = Warm-Season Graminoid

Noxious Weed Category: X = Noxious Weed (listed on May 2006 Colorado State Noxious Weed List)

Shaded cells indicate success criteria were met in 2007.

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Table 3-114. PLF and OLF Species Seeded by Location and 2007 Total Species Richness Summary

Family	Scientific Name	East PLF Cover A15	West PLF Cover A19	East Face PLF A23	OLF Cover A25
<b>Graminoids</b>					
POACEAE	Agropyron caninum	X	X	X	X
POACEAE	Agropyron dasystachyum	X	X	X	X
POACEAE	Agropyron lanceolatus	X	X		
POACEAE	Agropyron smithii	X	X	X	X
POACEAE	Andropogon gerardii	X	X		
POACEAE	Andropogon scoparius				
POACEAE	Bouteloua curtipendula	X	X	X	X
POACEAE	Bouteloua gracilis	X	X	X	X
POACEAE	Buchloe dactyloides	X	X	X	X
POACEAE	Koteria pyrimidata	X	X		
POACEAE	Poa canbyi	X	X		
POACEAE	Sorghastrum nutans	X	X		
POACEAE	Sporobolus cryptandrus	X	X		
POACEAE	Stipa viridula	X	X	X	X
Total # Species Seeded		13	13	7	7
# Present in 2007		8	6	4	5
% Seeded Species Present in 2007		62	46	57	71
Total Species Richness in 2007		23	17	9	26

Table 3-115. PLF and OLF Basal Cover Summary at Revegetation Locations

Location	Basal Vegetation Cover (%)	Litter Cover (%)	Rock Cover (%)	Total Ground Cover (%)*	Bare Ground (%)
A15	12.3	49.2	45.0	106.5	0.0
A19	13.3	68.8	14.8	97.0	3.0
A23	3.5	87.8	11.0	102.3	0.0
A25	3.9	63.9	30.4	98.2	1.8

\* Numbers greater than 100 are an artifact of the sampling method using a cover class system and midpoints for analysis.

The Total Ground Cover value is the sum of the Basal Vegetation Cover, Litter Cover, and Rock Cover.

A third success criterion outlined in the Revegetation Plan states that a minimum of 30 percent relative cover of desired species must be present. Table 3-113 summarizes the foliar cover data for the PLF and OLF by location for 2007. The shaded row titled Total Herbaceous Native Cover represents the percentage of desired species at each location. The relative cover values at individual locations that are higher than 30 percent are shaded, indicating that these locations have met this success criterion. This criterion was met at both the PLF and OLF in 2007. The dominant species on the cover of the PLF in 2007 were slender wheatgrass, western wheatgrass, buffalo grass, and Canada bluegrass (*Poa compressa*). The east face of the PLF was dominated by slender wheatgrass, western wheatgrass, side-oats grama, and wild lettuce. Weed cover from forbs on the PLF cover was not very high in 2007 because portions had been treated with Milestone (aminopyralid) in spring 2006 and 2007 to keep the weeds down to allow for better establishment of the graminoids. Small amounts of diffuse knapweed, Canada thistle, filaree, and downy brome, all noxious weeds, were present on the landfill cover in 2007. On the east face of the PLF, diffuse knapweed was the only noxious weed present. At the OLF, the dominant species were slender wheatgrass, western wheatgrass, and diffuse knapweed. Both the east face of the PLF and the face of the OLF are scheduled for weed control efforts in 2008.

A fourth success criterion outlined in the Revegetation Plan states that no single species shall comprise more than 45 percent of the total relative cover. The relative cover of slender wheatgrass on the west PLF area was 60 percent, and this area did not meet the success criterion in 2007 (Table 3-113). No other species made up more than 45 percent of the relative cover at either the PLF or OLF.

Table 3-116 presents a summary of the pass/fail criteria for each revegetation area at the PLF and OLF monitored in 2007. Three of the four locations passed all four criteria in 2007. The only area that did not pass was the western portion of the PLF, which lacked the presence of greater than 50 percent of seeded species and had greater than 45 percent cover of slender wheatgrass. However, the criteria listed in the Revegetation Plan are an initial set of criteria established primarily for erosion protection. As stated in the Revegetation Plan, these "...criteria are provided as initial guidance; however, common sense combined with scientific data will need to be applied to final evaluations to determine whether further management actions are required at specific locations." The fact that three of the areas passed each of the criteria listed in the Revegetation Plan does not mean that the vegetation has established to a desirable level at either landfill as of 2007. A good, healthy stand of vegetation is desirable on both landfills to protect the covers and provide good erosion control. Proactive management of the revegetation areas is critical to success. These data are useful for making management decisions and they provide documentation of the successional changes at the revegetation locations. This documentation can be used to help improve revegetation techniques at the Site.

*Table 3-116. 2007 PLF and OLF Success Criteria Evaluation Summary*

Location	>30% Relative Cover of Desired Species	>70% Total Ground Cover (Litter, Rock, and Basal Veg Cover)	50% or More of Seeded Species Present	No Single Species With >45% Relative Foliar Cover	PASS/FAIL
A15	PASS	PASS	PASS	PASS	PASS
A19	PASS	PASS	FAIL	FAIL	FAIL
A23	PASS	PASS	PASS	PASS	PASS
A25	PASS	PASS	PASS	PASS	PASS

### 3.3.2.6 Photomonitoring Results

Photomonitoring results are presented on the Ecology DVD found at the end of the report.

## 3.3.3 Wildlife Monitoring

Wildlife monitoring has been conducted as part of the ongoing ecological monitoring at the Site since the early 1990s. The frog vocalization surveys were conducted on April 18 and 28, 2007.

### 3.3.3.1 Frog Vocalization Monitoring

Although occasional frog observations were noted while conducting general wildlife monitoring in the past, there were no specific attempts to monitor frog populations until 1998. Even though an annual presence/absence record for amphibians was being established as part of general wildlife monitoring, the lack of a specific methodology precluded the ability to effectively track population abundance or distribution of these species at the Site. In an effort to better track amphibian populations and use that information as an indicator for detecting changes in the

health of aquatic ecosystems, a systematic and recognized monitoring program was initiated that was based on a nationally recognized protocol for monitoring frogs. Amphibians are an important group to track because their semiaquatic nature makes them particularly sensitive to aquatic impacts (Blaustein and Wake 1995). The boreal chorus frog (*Pseudacris triseriatus*) was chosen as the best candidate at the Site for vocalization monitoring and can also serve as an indicator species for tracking general amphibian population abundance on site.

In 2007, 20 locations were sampled for species presence/absence and population abundance (Figure 3-244). Boreal chorus frogs were recorded at 16 of the 20 sample locations (80 percent) surveyed in 2007 (Table 3-117). Figure 3-245 shows the frequency of the different vocalization indices at all 20 locations sampled in 2007. Nine of the locations sampled (45 percent) had full choruses of frogs calling (vocalization index 3). Two locations (10 percent) had multiple individuals calling with overlaps between the calls (vocalization index 2). Five locations (25 percent) had a vocalization index of 1, where individuals could be counted but the calls were not overlapping. The remaining four locations (20 percent) had no frogs calling (vocalization index 0).

On the evenings when sampling was conducted in 2007, the average water and air temperature was 12 °C and 15 °C, respectively, on April 18 and 18 °C and 16 °C, respectively, on April 28. No precipitation occurred on the days when sampling was conducted, and evening cloud cover was 75 percent on April 18 and 13 percent on April 28.

Table 3-117 and Figure 3-245 show the 2007 results in comparison to the data collected since 1999. The 1998 data are not shown because sample locations were different from those of 1999 and later. The 2007 mean vocalization index (1.8) is midway in the range of values observed from previous years, which have ranged from 1.2 to 2.4. Because the boreal chorus frog requires water to mate and lay eggs in, the overall abundance of the frogs at the Site appears to be related to how much water is available at the Site during the spring. Available monitoring data indicate that frogs were least abundant in 2003 and 2006 (Table 3-117, no data were collected in 2002). In 2002, the drought limited the available surface water for breeding and affected abundance into 2003. During the fall and winter of 2005–2006, drought conditions prevailed again at the Site, which left few locations with standing pools of water available for breeding in spring 2006. Additionally, many of the ponds at the Site were drained in midsummer 2005 for sediment sampling. The lack of precipitation after they were drained resulted in little to no water present at many of these locations. In winter 2006–2007, an above-average snowfall at the Site resulted in an abundance of standing surface water in spring 2007. This abundance of surface water is reflected in the increased abundance of frogs in 2007 compared to 2006. Overall, the abundance of boreal chorus frogs at the Site in 2007 was good and was indicative of the good quality of the aquatic and riparian habitat available at the Site.

In addition, during the surveys on April 28, near sample location 1 in the western portion of the Site, a large chorus of Woodhouse's toads was heard, and the toads were observed in the upper reaches of the main channel of the Rock Creek drainage. A vocalization index of 3 was recorded in this part of the drainage for the Woodhouse's toads. Photographs were taken of the toads near an old stock pond in the drainage (Figure 3-246). Although occasionally a Woodhouse's toad has been observed or heard calling at the Site, this degree of abundance has not been recorded or noted since at least the early 1990s, when more intensive ecological studies began at the Site. Perhaps the abundance was related to the heavy snowfalls at the Site during the winter of 2006–2007.

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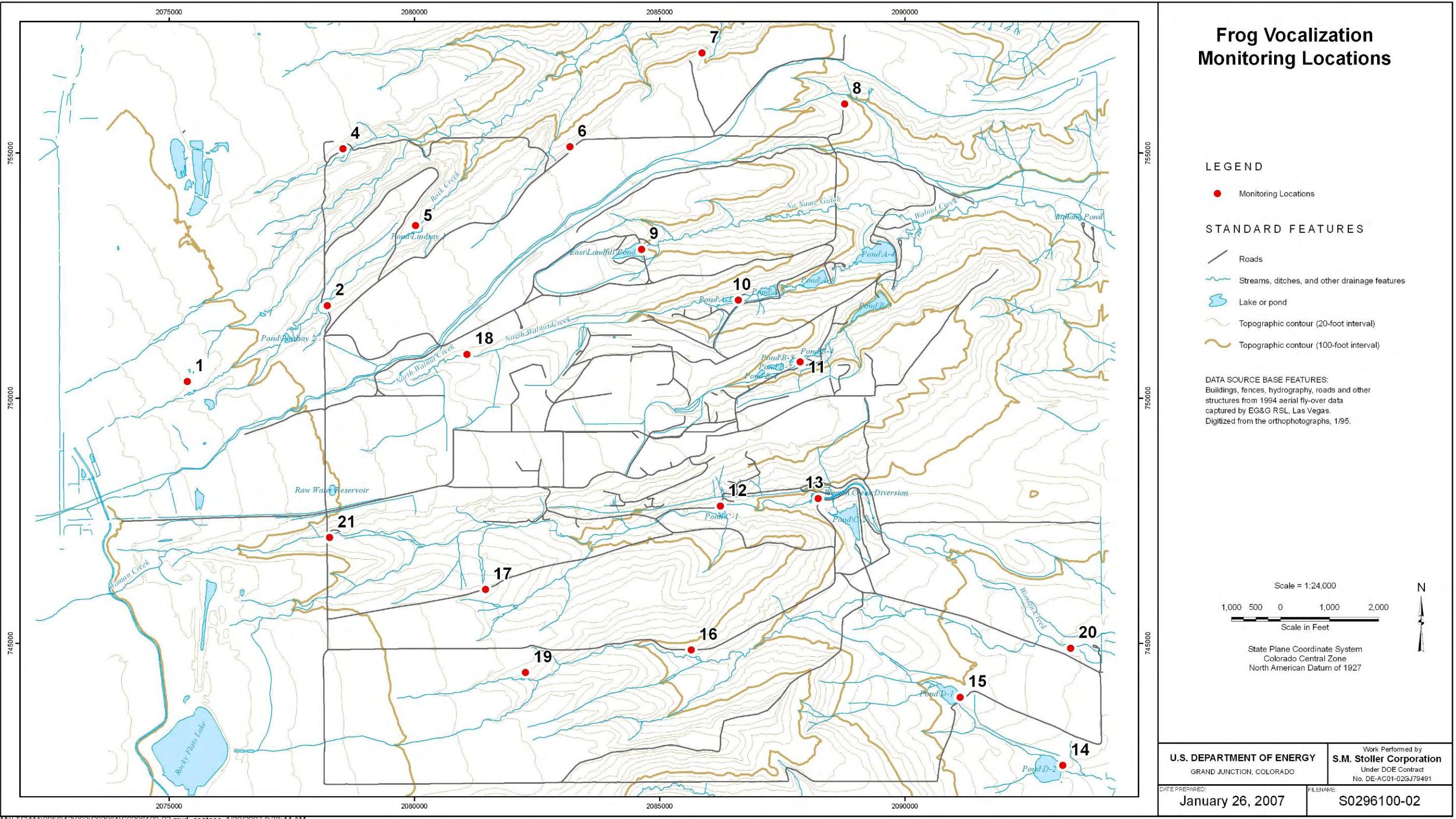


Figure 3-244. Frog Vocalization Monitoring Locations

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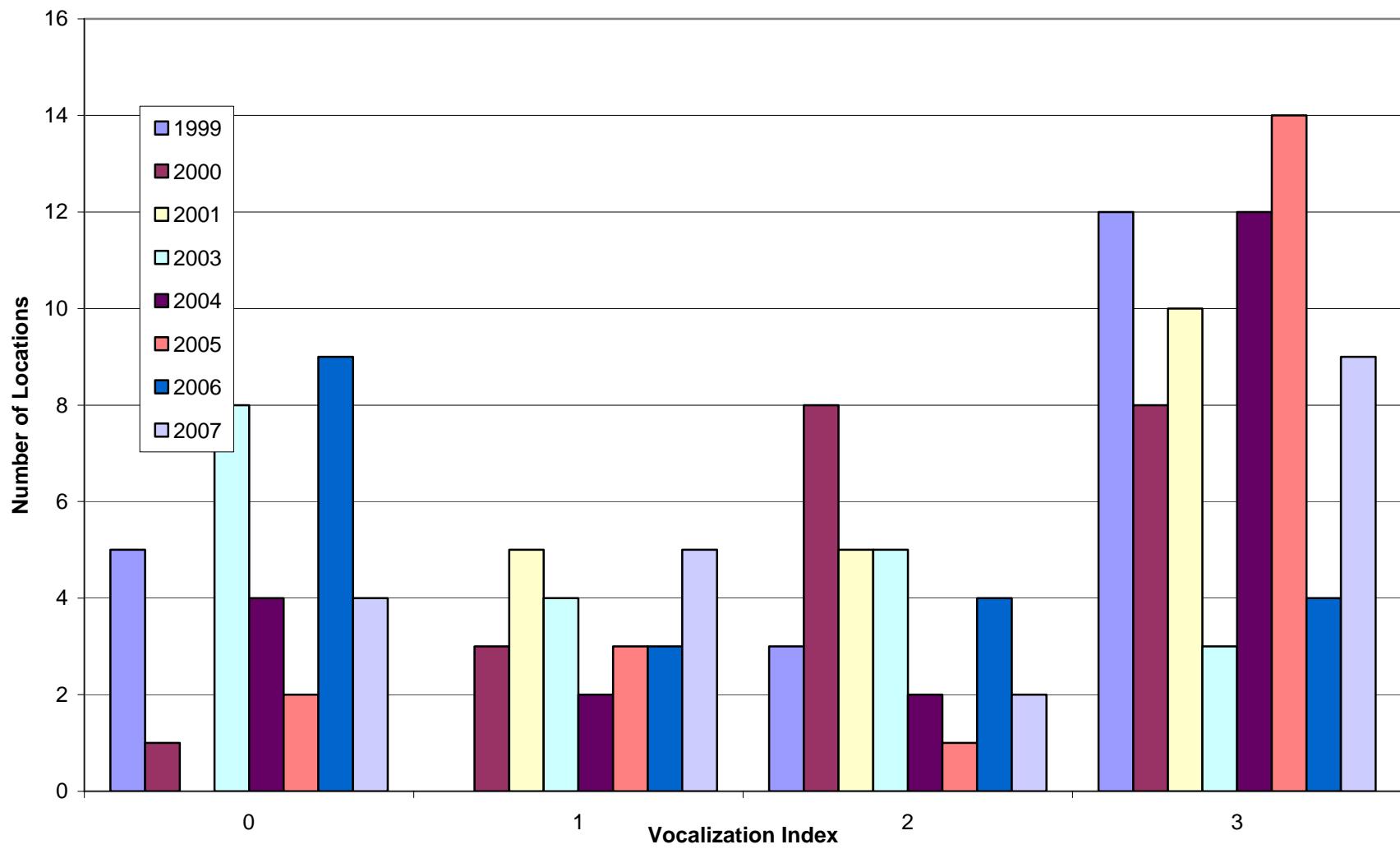


Figure 3-245. Frog Vocalization Summary

*Table 3-117. Frog Vocalization Summary 1999–2007\**

<b>Site Number</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
1	3	2	1	1	3	3	1	3
2	3	2	3	2	2	3	2	3
4	3	2	3	0	1	1	0	1
5	3	3	3	0	3	3	0	1
6	3	2	2	2	3	3	0	0
7	3	2	3	0	3	3	3	3
8	3	3	2	0	3	3	3	2
9	2	2	2	0	1	1	1	3
10	3	3	3	3	3	3	0	3
11	3	1	3	1	3	2	2	3
12	0	3	1	2	3	3	3	3
13	3	3	3	3	3	3	3	2
14	3	3	3	2	3	3	2	3
15	0	2	2	3	0	3	0	3
16	0	1	3	1	0	0	0	0
17	0	0	1	0	2	1	0	0
18	3	2	1	2	3	3	1	1
19	2	3	2	1	0	3	0	1
20	2	3	3	0	3	3	2	1
21	0	1	1	0	0	0	0	0
Mean Vocalization Index	2.1	2.2	2.3	1.2	2.1	2.4	1.2	1.8
Grand Mean (1999-2007)	1.9							

Values are vocalization indices.



*Figure 3-246. Woodhouse's toads along the edge of an old stock pond in the western part of the Site on April 28, 2007*

### **3.3.4 Summary**

The Ecology Program at the RFS conducts monitoring of the ecological resources to ensure regulatory compliance and to preserve, protect, and manage those resources. Proactive management of the natural resources is critical to the long-term sustainability of the ecosystems at the Site. Noxious weeds continue to be a top priority as does the revegetation of the COU. Data from 2007 documented the continuing establishment of vegetation at revegetation locations. Noxious weed control activities and additional revegetation activities were conducted during 2007 to improve and enhance the vegetation at the Site. The monitoring results continue to provide useful information to assist in management activities. Full, detailed reports and analyses for each field monitoring effort are presented as stand-alone reports on the accompanying Ecology DVD.

## **3.4 RFLMA Ecological Sampling**

The Ecological Risk Assessment determined that residual contamination does not represent a significant risk of adverse ecological effects. The CAD/ROD, however, requires that specific additional sampling be conducted to reduce the uncertainties determined in the Ecological Risk Assessment. RFLMA Attachment 2, Table 5, Ecological Sampling, specifies a minimum of three quarterly water samples at Ponds A-4, B-5, and C-2 for radium-228, cyanide, and ammonia. Ecological sampling and data evaluation protocols are summarized in Table 3-118. These locations are shown on Figure 3-1.

*Table 3-118. Sampling and Data Evaluation Protocols for RFLMA Ecological Sampling*

<b>Location</b>	<b>Location Description</b>	<b>Sample Types/ Frequencies</b>	<b>Analytes</b>	<b>Data Evaluation</b>
Pond A-4	Pond A-4 at east end of pond near outlet works (water); at deepest location in pond (sediment)	Quarterly grabs (water); One-time (sediment)	Ammonia, cyanide, Ra-228	Consultation with regulators
Pond B-5	Pond B-5 at east end of pond near outlet works (water); at deepest location in pond (sediment)	Quarterly grabs (water); One-time (sediment)	Ammonia, cyanide, Ra-228	Consultation with regulators
Pond C-2	Pond C-2 at east end of pond near outlet works (water); at deepest location in pond (sediment)	Quarterly grabs (water); One-time (sediment)	Ammonia, cyanide, Ra-228	Consultation with regulators

The first quarterly water sampling at Pond C-2 was performed on February 12, 2007. Ponds A-4 and B-5 were sampled for radium-228 and ammonia on February 12, 2007, and for cyanide on March 19, 2007. The second quarterly water sampling was performed at Ponds A-4, B-5, and C-2 on May 4, 2007. The third quarterly water sampling was performed at Ponds A-4, B-5, and C-2 on September 12, 2007. Sediment sampling was performed at Ponds A-4, B-5, and C-2 on July 13, 2007.